

Jim
Have Good
Apollo 9 CDR.

Rusty

Jim McDivitt
APOLLO 9 CDR
Flown on Apollo 9

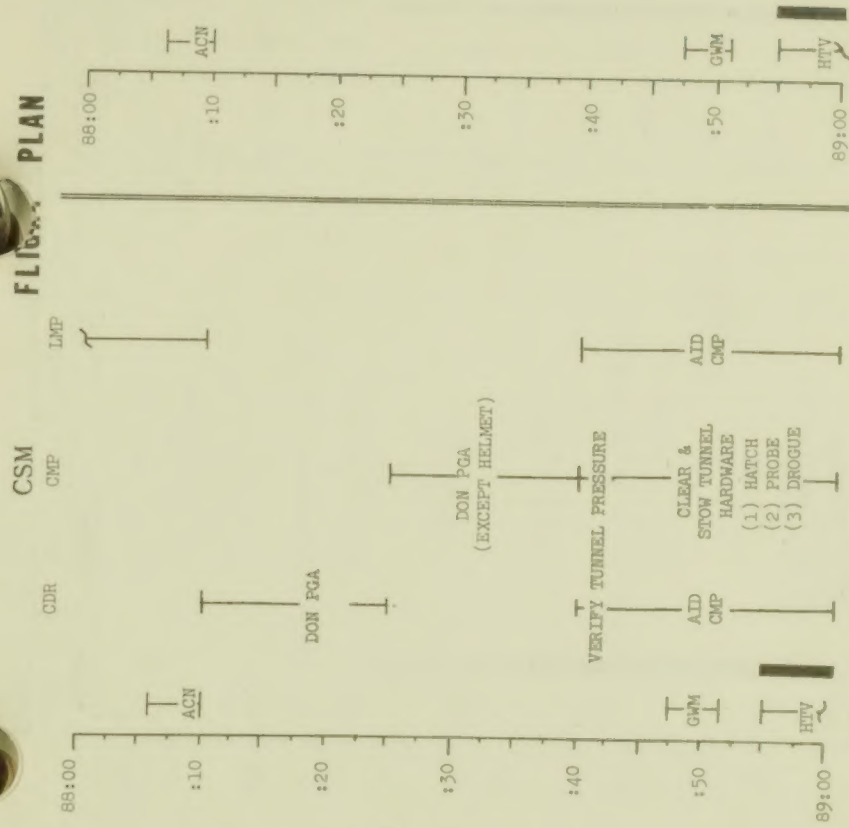
LMP
APOLLO 9

APOLLO 9	
LM	
RENDEZVOUS ACTIVATION CHECKLIST	
PART NO	S/N
SKB32100015-301	1003

FLIGHT PLAN

I.M

NO LM
ACTIVITIES

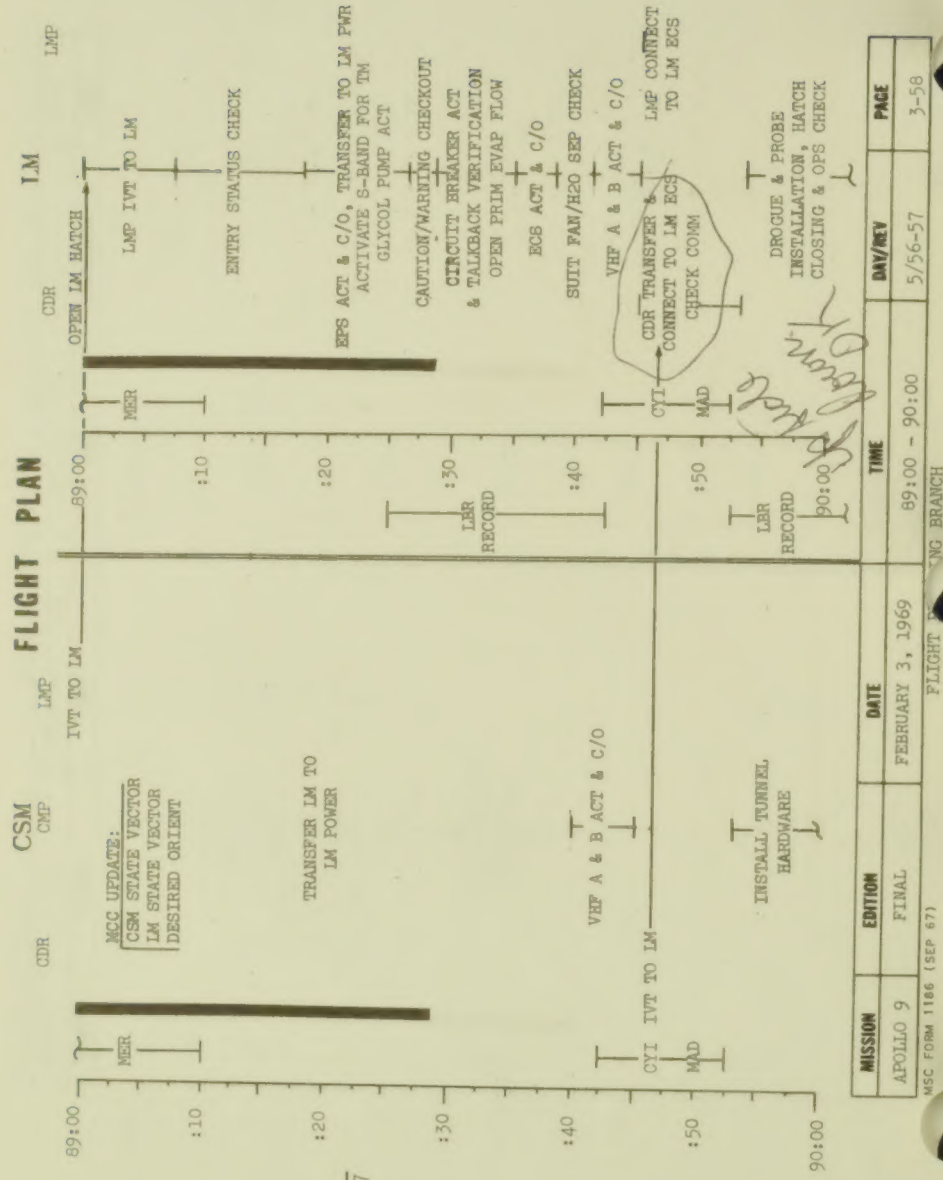


MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
AFOLLO 9	FINAL	FEBRUARY 3, 1969	88:00 - 89:00	5/56-57	3-57

FLIGHT PLANNING BRANCH

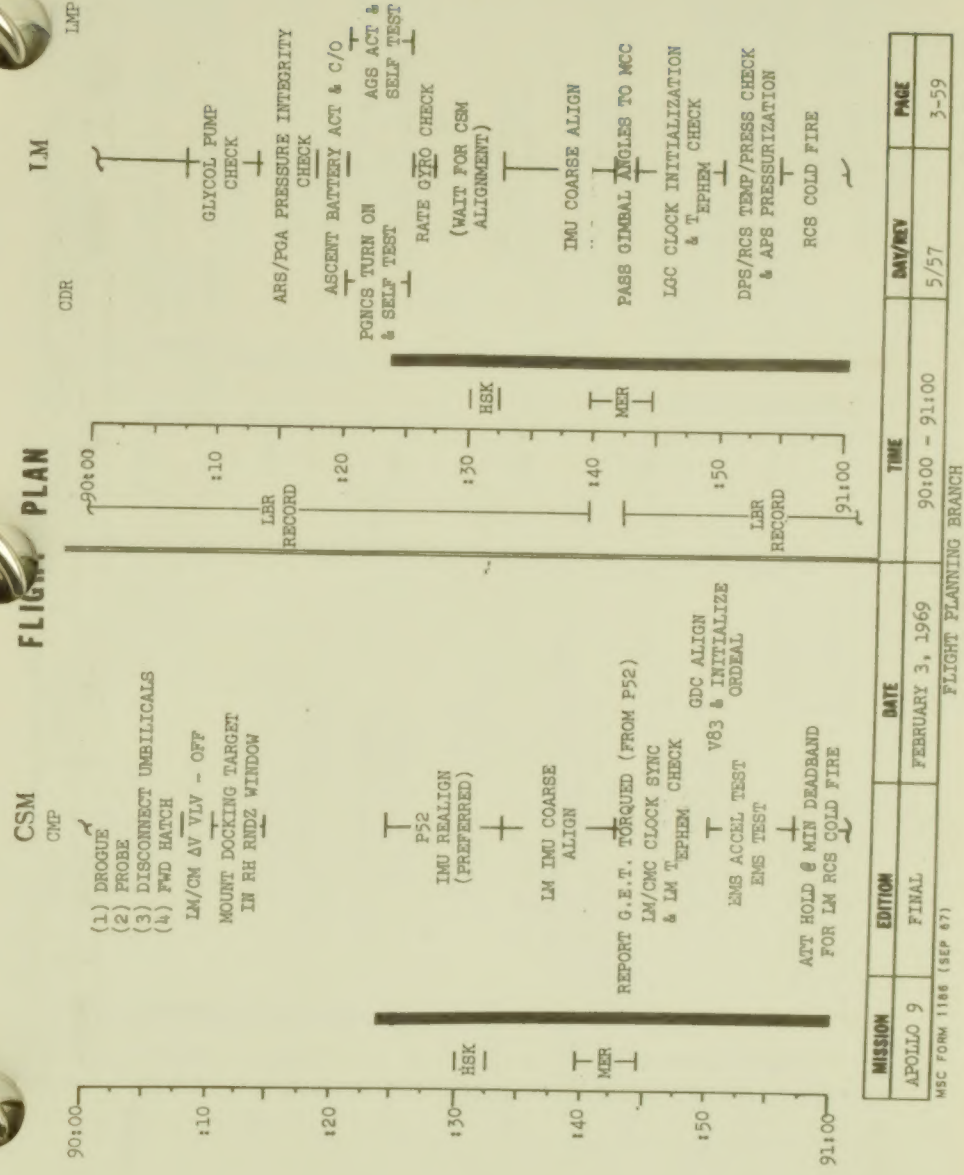
MSC FORM 1186 (SEP 67)

FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	09:00 - 90:00	5/56-57	3-58

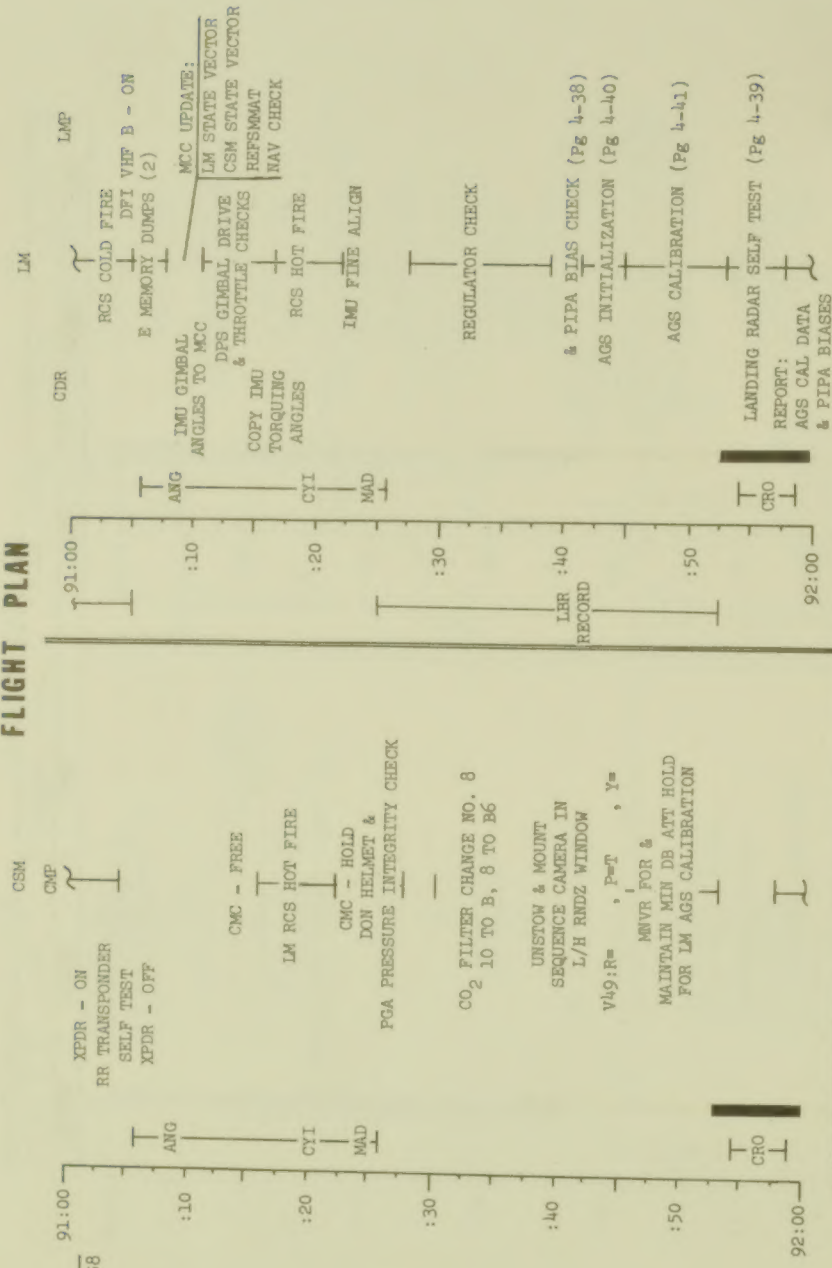
FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	90:00 - 91:00	5/57	3-59

MSC FORM 1186 (SEP 67) BY TOLSON, ET AL. APPROVED FOR RELEASE

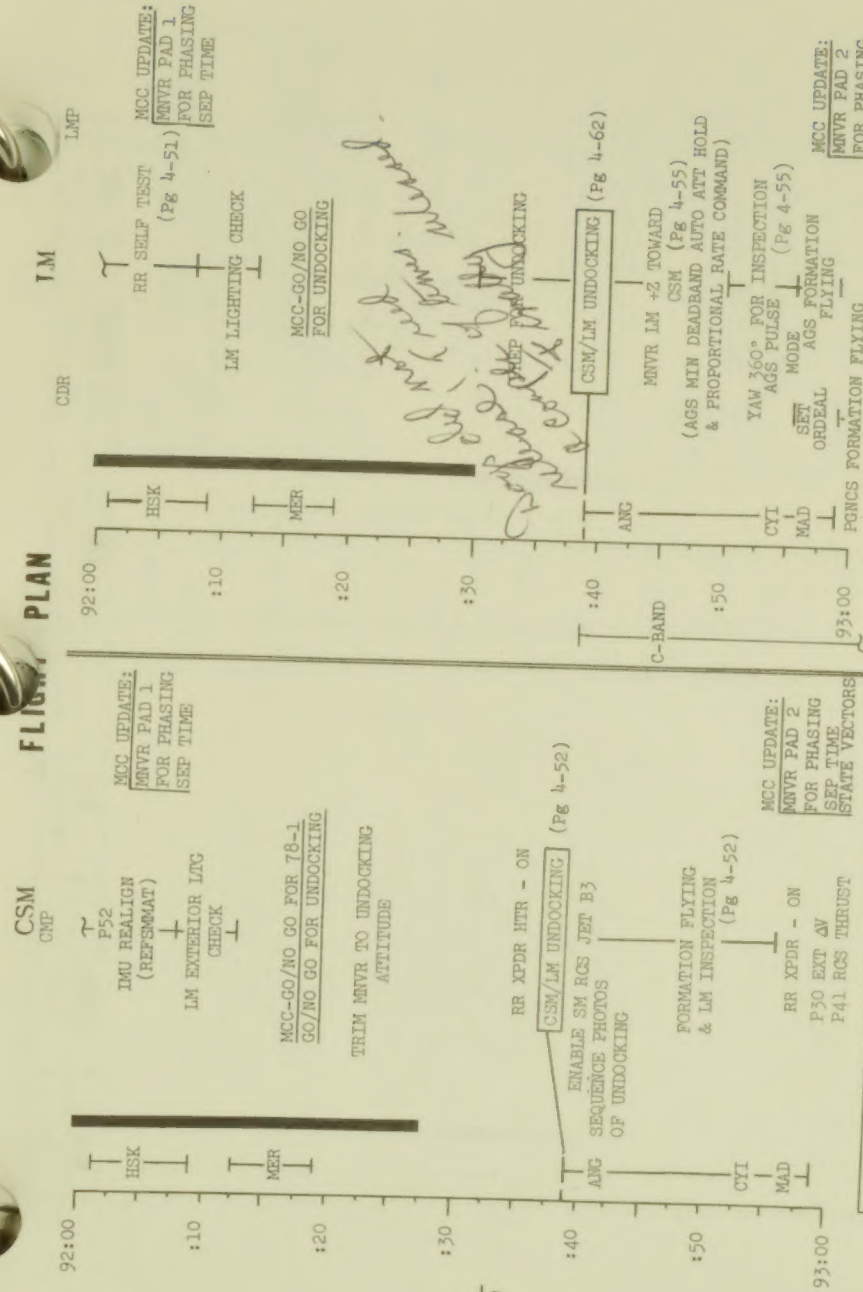
FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	91:00 - 92:00	5/57-58	3-60

FLIGHT PLANNING BRANCH

FLIGHT PLAN

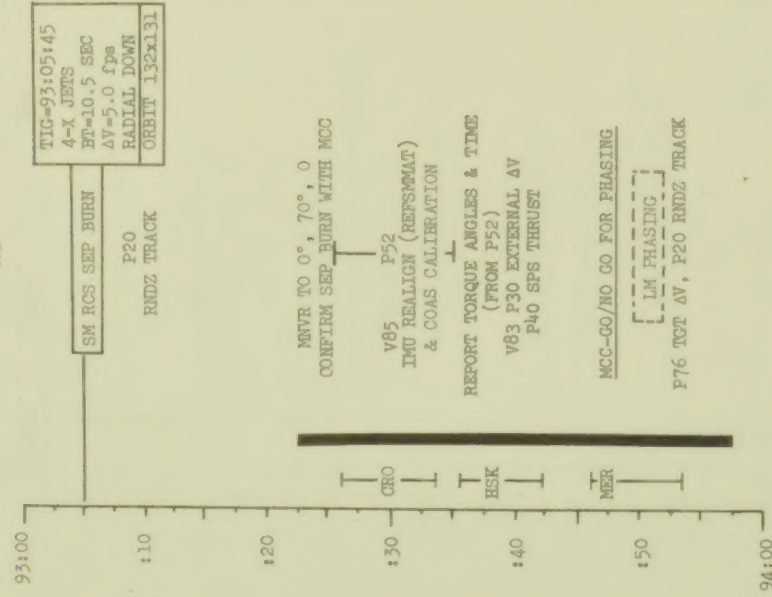


MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	92:00 - 93:00	5/58-59	3-61

FLIGHT PLANNING BRANCH

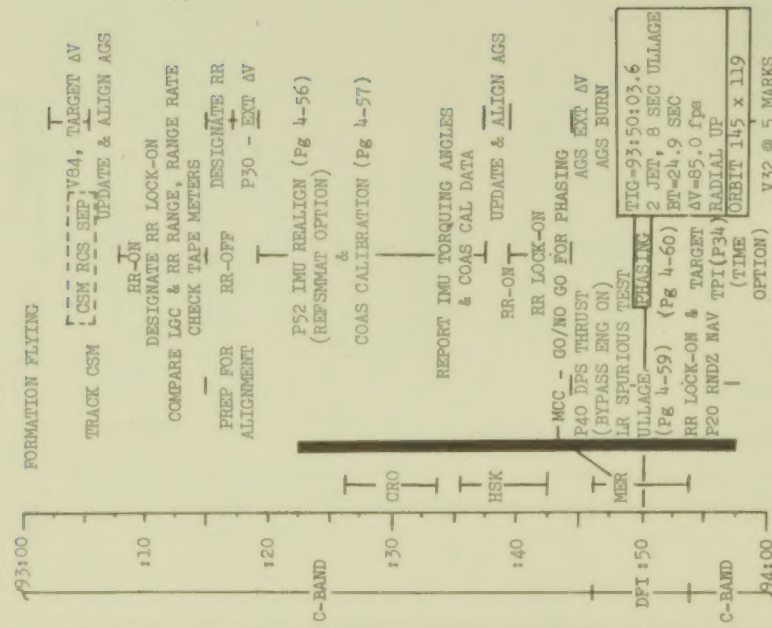
FLIGHT PLAN

CSM
CMP



LM

CDR



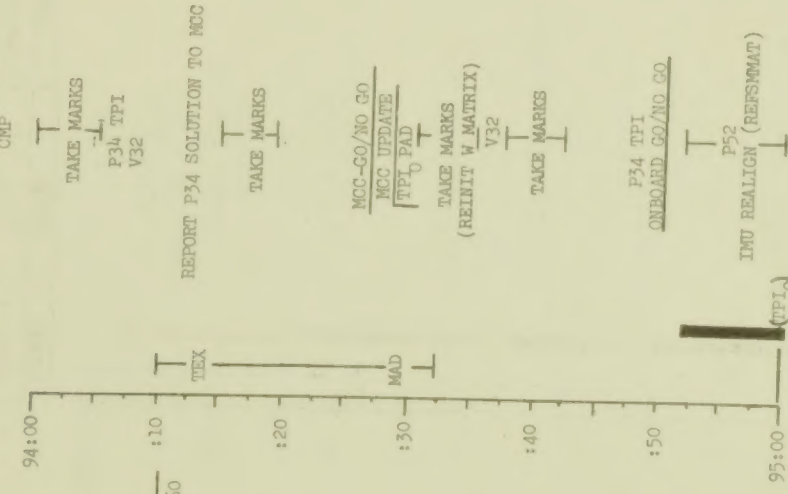
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	93:00 - 94:00	5/59	3-62

MSC FORM 1186 (SEP 67)

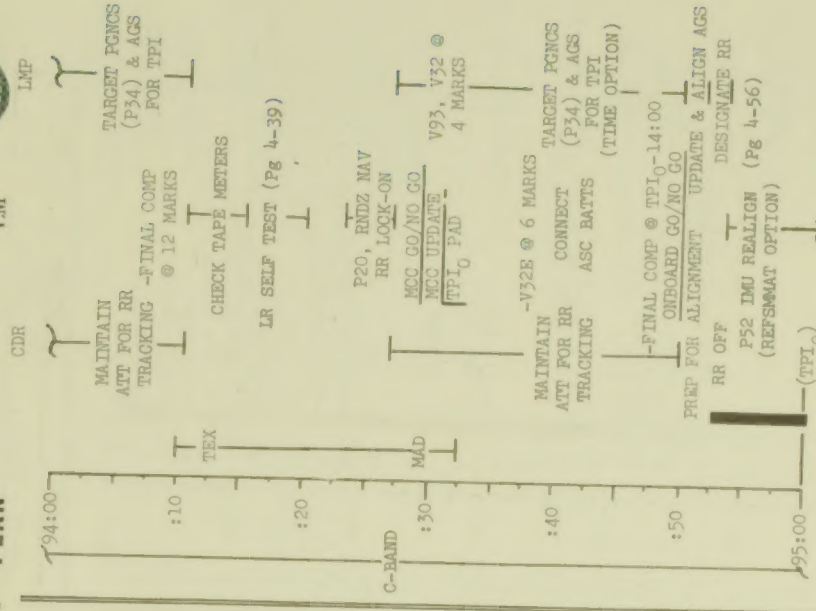
FLIGHT PLANNING BRANCH

FLIGHT PLAN

CSM
CMP



LM



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	94:00 - 95:00	5/59-60	3-63

MSC FORM 1186 (SEP 67)

FLIGHT PLANNING BRANCH

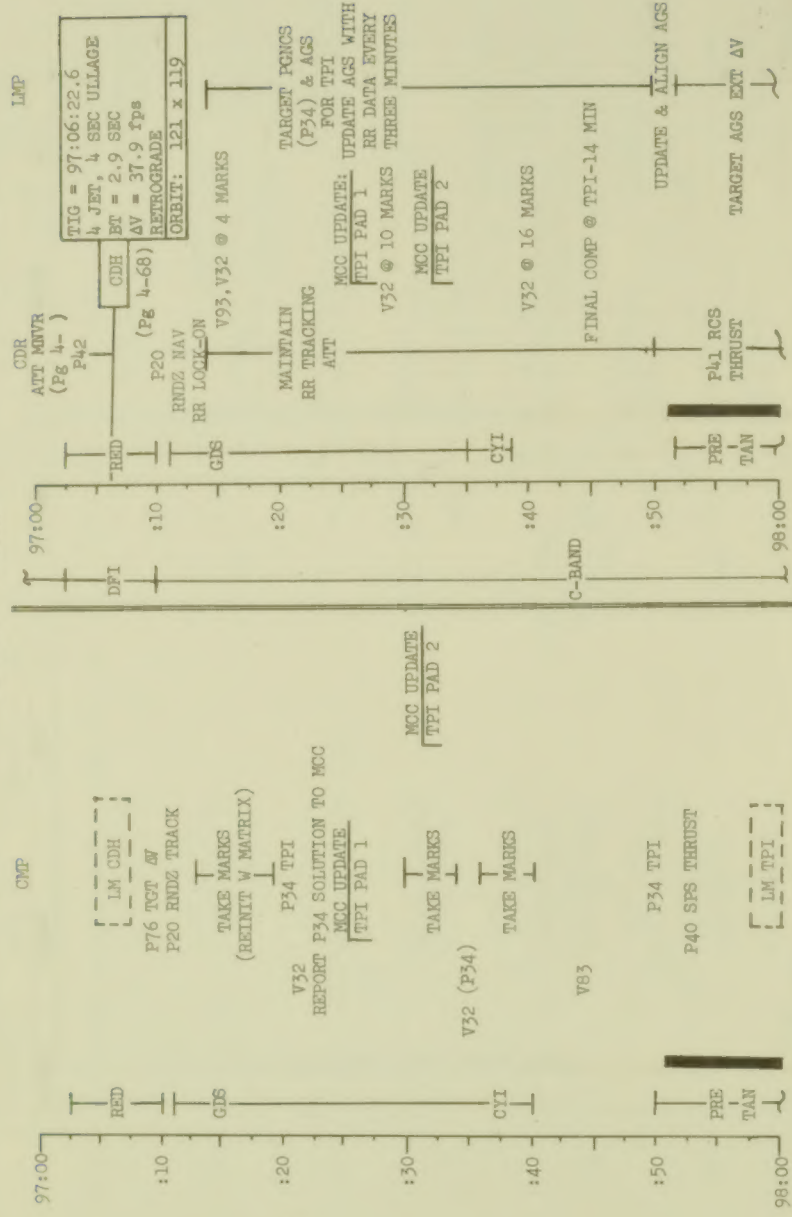


MSC FORM 1106 (SEP 67)

FLIGHT PLAN

CSM

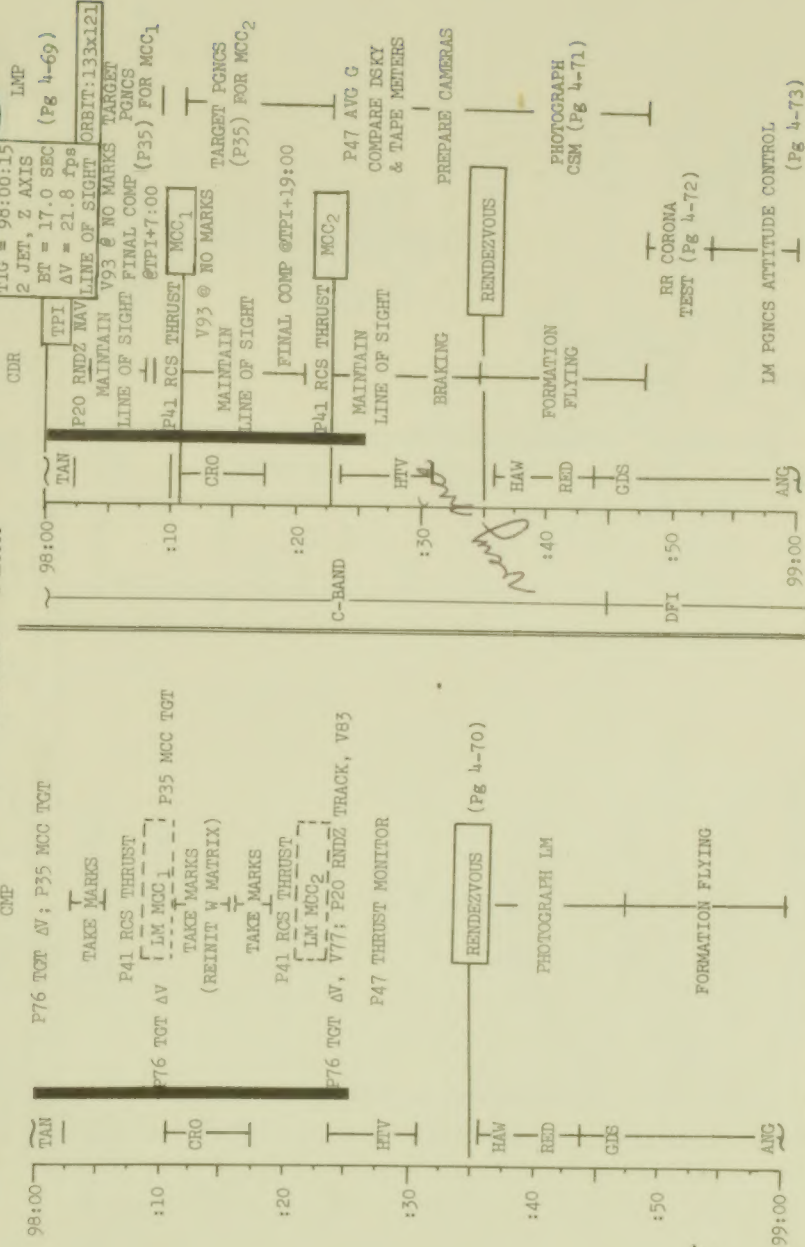
LM



FLIGHT PLAN

CSM

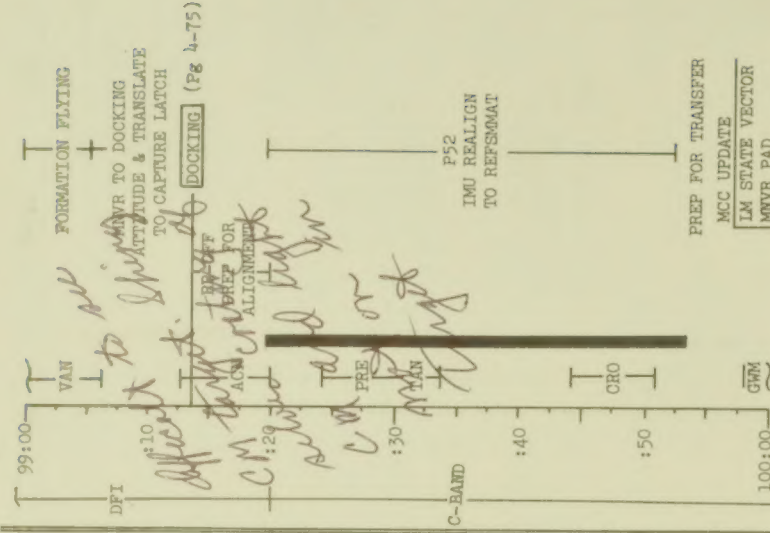
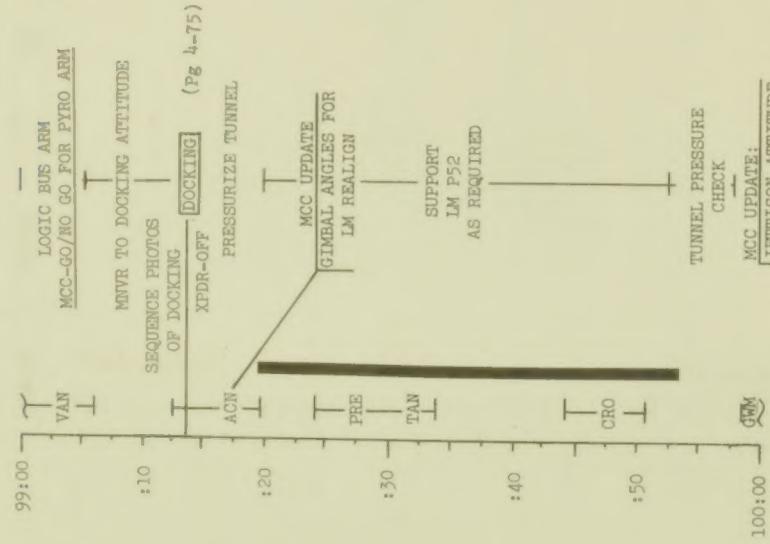
LM



FLIGHT PLAN

CSM

LM



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	99:00 - 100:00	5/63	3-68

MSC FORM 1186 (SEP 67)

FLIGHT PLANNING BRANCH

FLIGHT PLAN

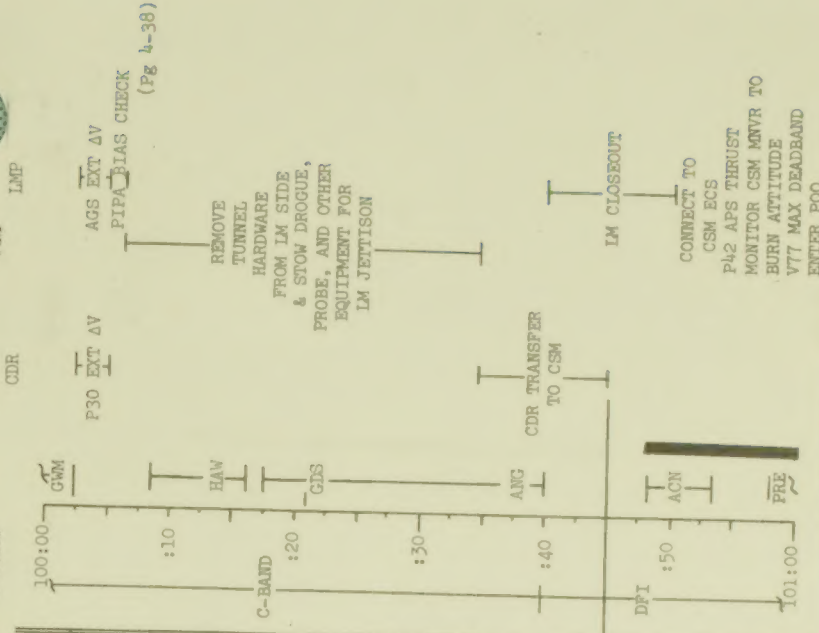
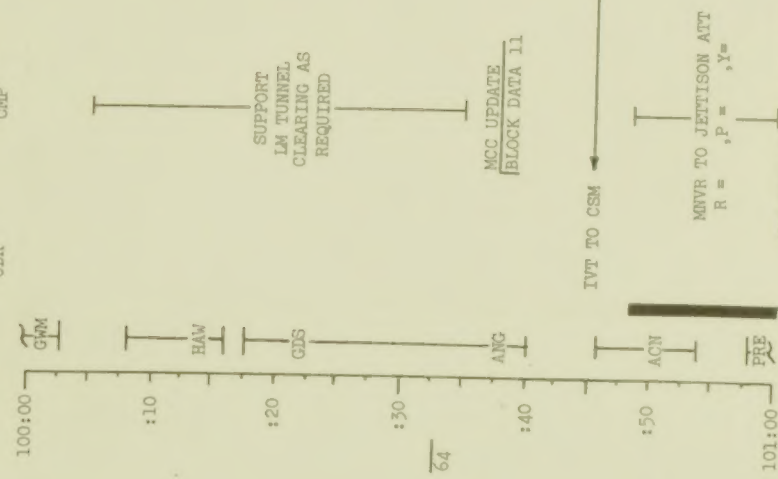
CSM

CDR

LMP

LM

LMP

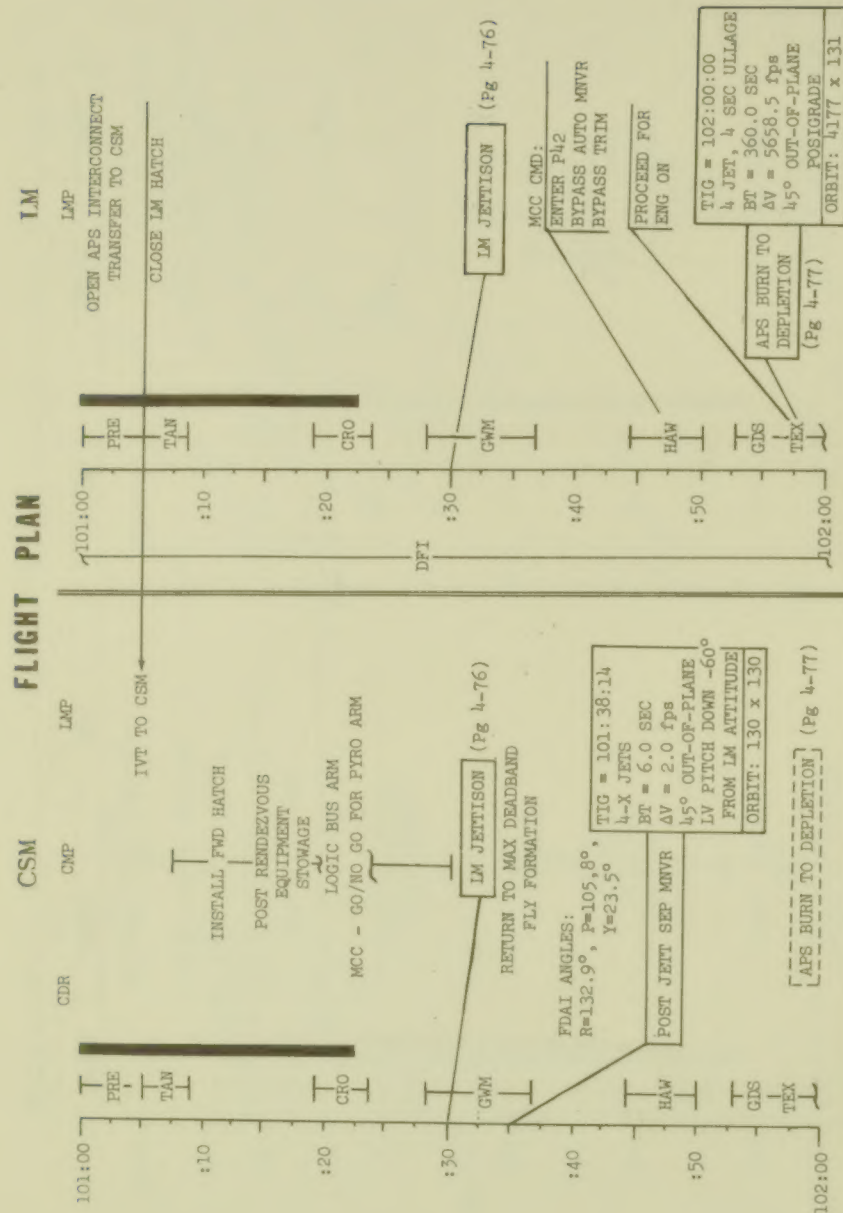


MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	100:00 - 101:00	5/63-64	3-69

MSC FORM 1186 (SEP 67)

FLIGHT PLANNING BRANCH

FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 9	FINAL	FEBRUARY 3, 1969	101:00 - 102:00	5/64	3-70

MSC FORM 1186 (SEP 67)



NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION

APOLLO IX LM-3

FINAL FLIGHT CREW RENDEZVOUS ACTIVATION CHECKLIST

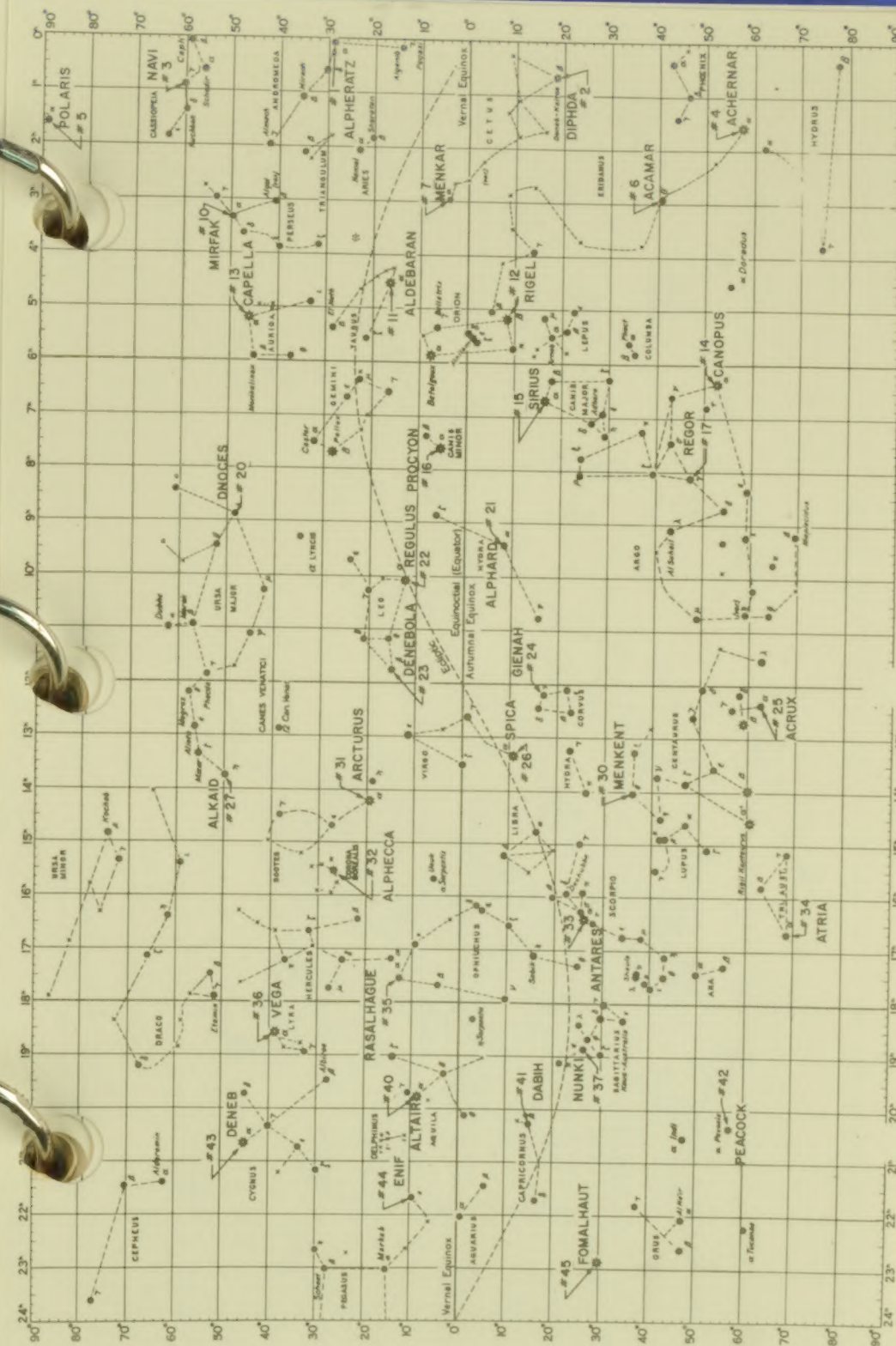
PREPARED BY
GUIDANCE & CONTROL
SECTION
FLIGHT CREW SUPPORT
DIVISION

FEBRUARY 24, 1969

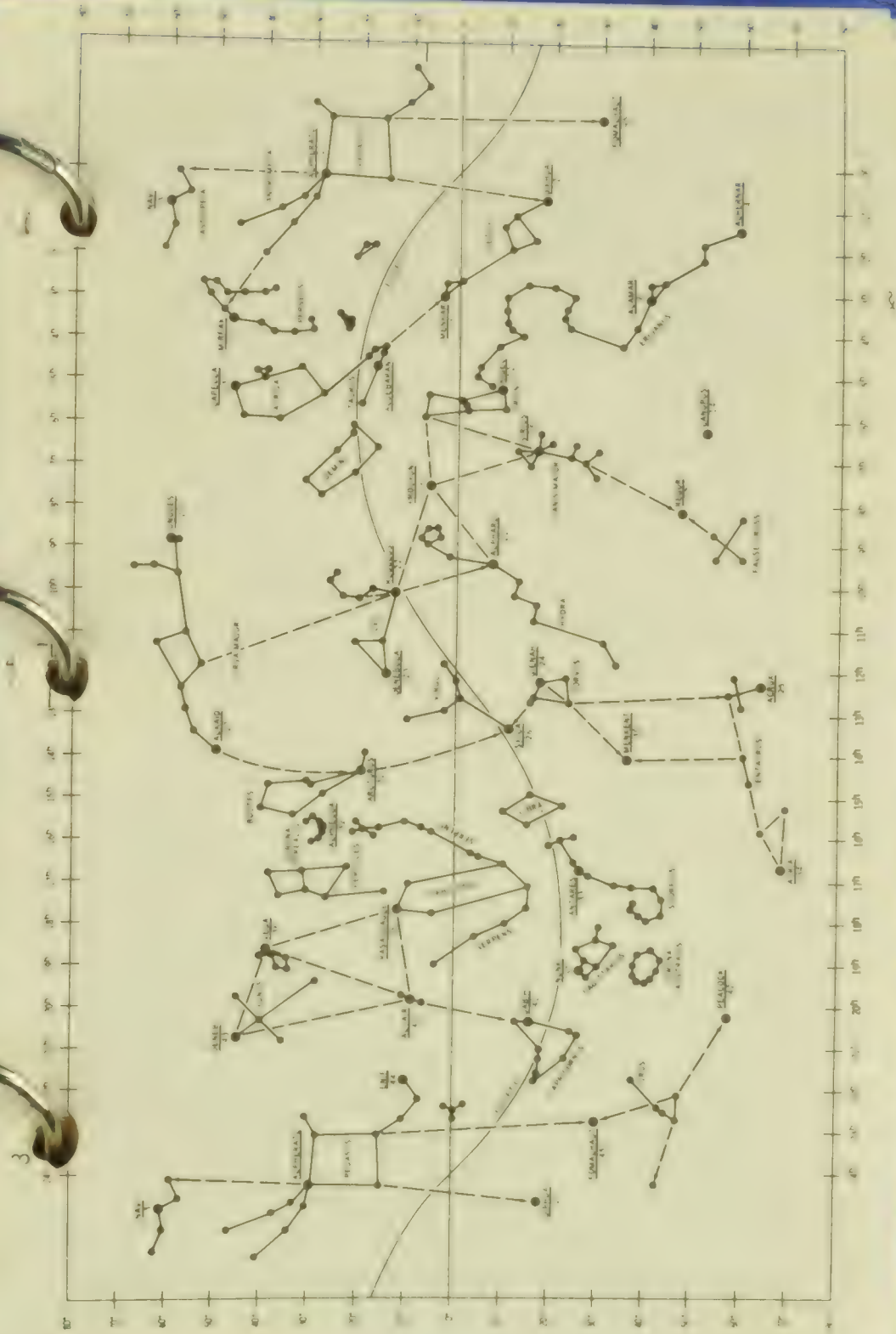


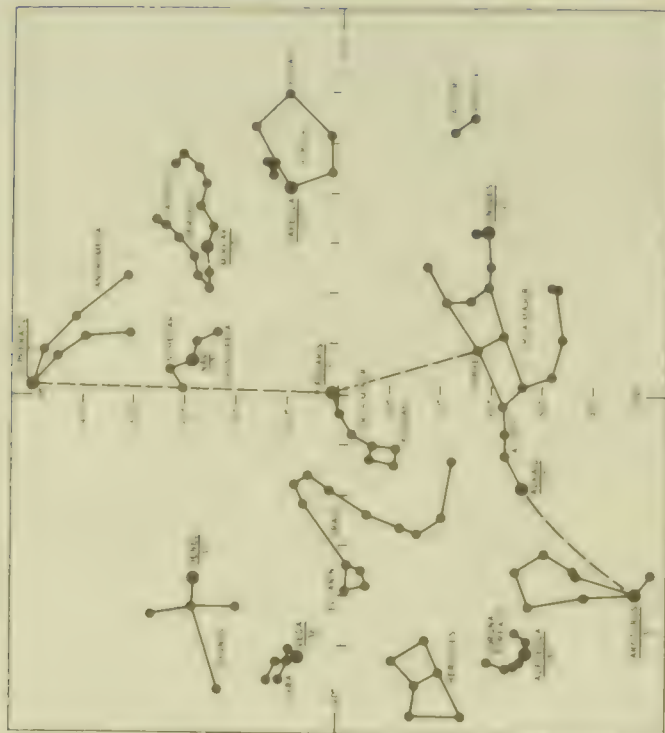
MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

IVT, ENTRY STATUS, EPS, TM, GLYCOL PUMP, C/W	1
CB ACT, TB, ECS, SUIT FAN/H2O SEP, S-BAND & VHF ACT	2
CDR TRANSFER, DROGUE AND PROBE, OPS	3
GLYCOL PUMP, ARS/PGA PRESS, ASC BAT ACT	4
PGNS ACT, AGS ACT, RATE GYRO CHECK	5
DOCKED IMU ALIGNMENT, LGC CLOCK, TEPHEM	6
APS PRESS, RCS COLD FIRE	7
E-MEMORY DUMP, LGC UPDATE, GIMBAL DRIVE & THROT	8
RCS HOT FIRE	9
REGULATOR CHECK, PIPA BIAS, AGS INIT, AGS CALIBRATION	10
LR SELF TEST RR SELF TEST	11
LIGHTING CHECK, PREP FOR UNDOCKING	12
PGNS/AGS PREP, PIPA BIAS, PREP FOR XFER, CDR TRANSFER	13
LM CLOSEOUT, LMP TRANSFER	14
EMERGENCY	15
PHOTO LOGS, CREW COMMENTS	16

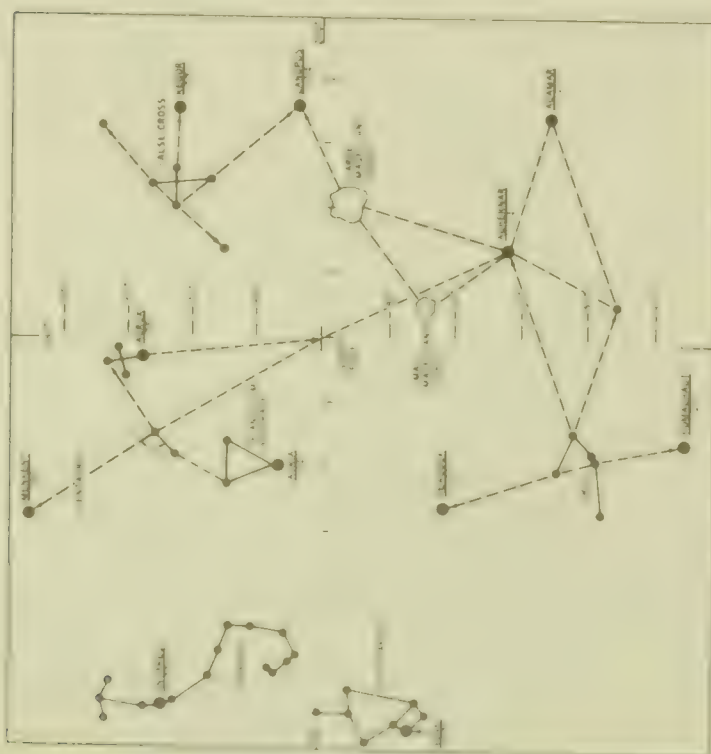


- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 1
- 2
- 3
- 4
- 5





NORTHERN STARS



SOUTHERN STARS

Basic Date Feb 24, 1969
Changed

LM-3

3

RDZ-1

INTRAVEHICULAR TRANSFER TO LM

5 min

Stow In ISA:
SEQ Camera & 5mm Lens
1 CEX368 Mag (L)
Camera Handle
CDR & LMP RDZ Charts & Procedures (2), &
Update Cards (May Be In LM)
EVA Checklist (1)

LMP Transfer To LM With LMP RDZ
Checklist & Flight Plan Card
Actuate CABIN DUMP VALVE & Open Hatch
EXTERIOR LTG - OFF
FLOOD LIGHT - ALL
DES H2O - OPEN

DOCKING TUNNEL INDEX ANGLE $\Delta\Phi$ _____

Transfer ISA To LM

ENTRY STATUS CHECK

10 min

CB(11)
Row 1&2: All Open
Row 3: HEATERS: RNDZ RDR STBY - Close
LDG RDR - Close
LTG: ANUN/DOCK/COMPNT - Close
Row 4: PGNS: IMU STBY - Close
Row 5: EPS: BAT FEED TIE (2) - Close
CROSS TIE BAL LOADS - Close
DES ECA - Close
DFI PWR - OFF

FDAI 1&2 - INRTL
EARTH/LUNAR - PWR OFF
LTG - OFF
MODE - HOLD/FAST
ALT SET - 130

FUEL & OXID VENT tb-bp
MASTER ARM - OFF

1
2
3
4
5
6
7
8
9
10
1
2
3
4
5

1

RDZ-2

ASC He SEL - BOTH
LDG GEAR DEPLOY tb-bp
STAGE-SAFE (Guarded)

S-BAND T/R - OFF (VOL-6)
ICS T/R - OFF (VOL-6)
RELAY - OFF
VOX-ICS (VOX SENS-7)
AUDIO CONT - NORM
VHF A&B - OFF (VOL-6)
MASTER VOL - 6
COAS - OFF

TTCA (CDR) - JETS (Dn)

TIMER CONT - STOP
OVERRIDE ANUN - OFF
OVERRIDE NUM - OFF
OVERRIDE INTEGRAL - OFF
SIDE PANELS - OFF
FLOOD OVHD/FWD - BRIGHT
ANUN/NUM - DIM
INTEGRAL - DIM

X-POINTER SCALE - HI MULT
RATE/ERR MON - LDG RDR/CMPTR
ATTITUDE MON - PGNS
GUID CONT - PGNS
MODE SEL - LDG RADAR
RNG/ALT MON - ALT/ALT RT
SHFT/TRUN - +50°
RATE SCALE - 25°/SEC
THR CONT - AUTO
MAN THROT - CDR
ENG ARM - OFF
X-TRANSL - 2 JETS
BAL CPL - ON
ASC He REG 1&2 - tb-gray
DESCENT He REG 1 tb-gray
DESCENT He REG 2 tb-bp
PRPLNT QTY MON - OFF
PRPLNT TEMP/PRESS MON - ASC
HELIUM MON - OFF
ABORT and ABORT STAGE - Flush/Guarded

Basic Date Feb. 24, 1969
Changed

8

9

Basic Date Feb. 24, 1969
Changed

10

11

12

Row 1:
Row 2:

RDZ-3

SYS A&B ASC FUEL & ASC OXID (4) - tb-bp
SYS A&B QUAD 1,4,2,3(8)-tb-gray
CRSFD - tb-bp
SYS A&B MAIN SOV - tb-gray
TEMP/PRESS MON - He
RCCA - OFF/RESET
RATE/ERR MON - LDG RDR/CMPTR
ATTITUDE MON - AGS
GLYCOL - PUMP 2
SUIT FAN - 1
O2/H2O QTY MON - ASC 2

ENG GMBL - ENABLE
DES ENG CMD OVRD - OFF
LDG ANT - DES
RADAR TEST - OFF
TEST MONITOR - ALT XMTR
SLEW RATE - HI
RNDZ RDR - AUTO TRACK
DEAD BAND - MIN
GYRO TEST - ROLL
ATTITUDE CONTROL (3) - MODE CONT
MODE CONTROL - ATT HOLD
DET - Up & STOP
TEMP MON - LDG
RCS SYS A/B-2 QUAD 1,2,3,4 - OFF
LTG: SIDE PANELS - OFF
FLOOD - ALL
OVHD/FWD - BRIGHT
EXTERIOR LTG - OFF
LAMP/TONE TEST - OFF
X-POINTER SCALE - HI MULT

ACA/4 JET (2) - ENABLE
TTCA/TRANSL (2) - ENABLE
RDZ ANT RELEASE - UNSTOWED
AOT - CL, ANGLE - 0000

TTCA (LMP) - JETS (Dn)
AGS STATUS - OFF

CB(16)
All Open
LTG: FLOOD - Close

2

3

4

5

6

7

8

9

10

11

12

3

4

5

1

RDZ-4

Row 3: STAB/CONT: ASA - Close
 All Open
 Row 4: HEATERS: S-BD ANT - Close
 EPS: DES ECA - Close
 CROSS TIE BAL LOADS - Close
 BAT FEED TIE (2) - Close

13 POWER/TEMP MON - ED/OFF
 INVERTER - OFF
 BAT 1,2,3,4 - tb-bp
 DES BATS - tb-bp
 BAT 5&6 NORMAL & BACK UP FEED (4) tb-bp

14 AUDIO CONT - NORM
 S-BAND T/R - OFF (VOL-6)
 ICS T/R - OFF (VOL-6)
 RELAY - OFF
 VOX - ICS (VOX SENS-7)
 VHF A&B - OFF (VOL-6)
 MASTER VOL - 6
 VHF A RCVR VOICE BU - OFF

15 S-BAND MODULATE - PM
 XMTR/RCVR - OFF
 PWR AMPL - OFF
 VOICE - OFF
 PCM - OFF
 RANGE - OFF/RESET
 VHF A XMTR & RCVR - OFF (SQUELCH - 3)
 VHF B XMTR & RCVR - OFF (SQUELCH - 3)
 TELEMETRY BIOMED - OFF
 TELEMETRY - HI
 RECORDER - OFF tb-bp
 VHF - 1/PLSS TEST
 TRACK MODE - OFF
 PITCH - +255°
 YAW - -30°
 S BAND - 2

16 SUIT GAS DIVERter - PULL/EGRESS
 CABIN REPRESS - CLOSE
 PLSS FILL - CLOSE
 PRESS REG A&B - CLOSE
 DES 02 - CLOSE

Basic Date Feb. 24, 1969
 Changed

Basic Date Feb. 24, 1969
 Changed 1

2

LM-3

RDZ-5

1&2 ASC 02 - CLOSE
 SUIT ISOL (2) - SUIT DISC
 SUIT CIRCUIT RELIEF - AUTO
 CABIN GAS RETURN - AUTO
 CO2 CANISTER SEL - PRIM
 PRIM & SEC CO2 CANISTER - CLOSE
 WATER SEP SEL - PULL/SEP 2
 ASC H2O - CLOSE
 SEC EVAP FLOW - CLOSE
 PRIM EVAP FLOW No. 2 - CLOSE
 DES H2O - OPEN
 WATER TANK SELECT - DES
 SUIT TEMP - COLD
 CABIN TEMP - NORM

CABIN RELIEF AND DUMP (2) - AUTO

DFI PRIMARY - ON, SECONDARY - OFF
 UTILITY LIGHTS (Both) - As Required
 Fwd Hatch Closed & Locked

EPS ACTIVATION & CHECKOUT

5 min

CSM Position LM PWR - RESET Then OFF
 LTG: ANUN/NUM - BRIGHT (1 Caution, 9
 Power Failure Lts - On)

CB(11) INST: SIG CONDR 1 - Close
 EPS: XLUNAR BUS TIE - Close
 DES ECA CONT - Close
 DC BUS VOLT - Close
 CB(16) INST: SIG SENSOR - Close
 PCM/TE - Close
 SIG CONDR 2 - Close
 COMM: PRIM S-BD PWR AMPL - Close
 PRIM S-BD XMTR/RCVR - Close
 PMP - Close
 EPS: DISP - Close
 DC BUS VOLT - Close
 DES ECA CONT - Close
 XLUNAR BUS TIE - Close

- 3 CB(11) COMM: VHF B XMTR - Close
VHF B - DATA
TELEMETRY - LO
CSM Record LBR Data
- 4 Verify BAT 1,2,3,4 - tb-LO
DES BATS - gray
BATS 5&6 NORMAL & BACKUP (4) tb-bp
Check BAT And BUS Voltages (When BUS
Voltages Less Than 27v Select
High Voltage Taps)
- CB(16)EPS:CROSS TIE BAL
LOADS-Open
BAT 1 HI VOLTAGE-OFF/RESET
tb-bp
BAT 1 HI VOLTAGE - ON
tb-gray
Repeat For BATS 2,3,4
CB(16)EPS:CROSS TIE BAL
LOADS-Close
- 5 CB(11) AC BUS B&A: BUS TIE INV 2&1 (4)
- Close
AC BUS VOLT - Close
EPS: INV 1 - Close
CB(16) EPS: INV 2 - Close
- 6 POWER/TEMP MON - AC BUS
INV - 1 Then 2
CB(11) EPS: INV 1 - Open

ACTIVATE S-BAND FOR TM

1 min

- 1 S-BAND-PM, PRIM, PRIM, VOICE, PCM,
RANGE, OFF, LO
S-BAND ANTENNA - As Desired

GLYCOL PUMP ACTIVATION

1 min

- CB(16) ECS: DISP - Close
CB(11) ECS: GLYCOL PUMP AUTO TRNFR-Close
GLYCOL PUMP 1 - Close
GLYCOL PUMP AUTO TRNFR - Open
GLYCOL - PUMP 1
CB(11) ECS: GLYCOL PUMP 2 - Close
GLYCOL PUMP AUTO TRNFR - Close

CAUTION/WARNING CHECKOUT

2 min

- CB(16) INST: CWEA - Close (LGC, CES
AC, CES DC Warning Lts, PRE AMPS,
HEATER, GLYCOL, ECS Caution Lts,
H2O SEP Comp Lts-On)
LTG: ANUN/DOCK/COMPNT - Close
MASTER ALARM - Close (Master Alarm - On)
HEATERS: DISP - Close

- RCS TEMP/PRESS MON - Cycle Then He
HTR TEMP MONITOR - Cycle Then LDG
GYRO TEST - POS RT
LAMP/TONE TEST - Check All Positions

Basic Date Feb. 24, 1969
Changed

Basic Date Feb. 24, 1969
Changed

LM ?

CIRCUIT BREAKER ACTIVATION

5 min

1

Row 1: CB(11)
All Closed Except:
AC BUS B&A: AOT LAMP (2) - Open
RNDZ RDR - Open

Row 2: AC BUS A: RNG/RNG RT ALT/ALT RT - Close
All Closed Except:
RCS SYS A: QUAD 4,3,2,1 TCA (4) - Open

Row 3: All Closed Except:
STAB/CONT: ABORT STAGE - Open
(Possible Master Alarm-On With ATCA [PGNS])
AELD - Open
ATT DIR CONT - Open
ED: LDG GEAR FLAG - Open

Row 4: All Closed Except:
ECS: SUIT FAN 1 - Open
PGNS: LDG RDR - Open
RNDZ RDR - Open
(Possible LGC Warning and RESTART
Lt - On With LGC/DSKY)
IMU OPR - Open

Row 5: All Closed Except:
EPS: CROSS TIE BUS - Open
ASC ECA CONT - Open
INV 1 - Open
SLA/LEM ANT TRNFR (2) - Open
R/D INST A&B - Open
DFI PWR - OFF

2

Row 1: CB(16)
All Closed Except:
RCS: SYS B QUAD 1,2,3,4 TCA - Open

Row 2: All Closed Except:
STAB/CONT: AEA - Open
AELD - Open
ABORT STAGE - Open

Row 3: All Closed Except:
COMM: TV - Open
ECS: GLYCOL PUMP SEC - Open
(SUIT Fan Comp Lt-On With SUIT Fan ΔP
& Master Alarm May Go On With CO2
SENSOR)

Row 4: All Closed Except:
CAMR: SEQ - Open

Basic Date — Feb. 24, 1969
Changed — Mar. 25, 1969

LM-3

RDZ-9

EPS: ASC ECA CONT - Open
CROSS TIE BUS - Open

MISSION TIMER - SET

PRIM EVAP FLOW - OPEN (When Glycol
Temp >60°F)

RCS SYS A/B-2 QUAD 1,2,3,4 - AUTO

CB(16) INST: CWEA - Open & Reclose (Master
Alarm, HEATER, ECS, GLYCOL Caution, H2O
SEP, And SUIT FAN Lts - On)

✓ TB VERIFICATION

2 min

1 FUEL & OXID VENT (2) - bp
LDG GEAR DEPLOY - bp

2 ASCENT He REG 1&2 - gray
DESCENT He REG 1 - bp
DESCENT He REG 2 - bp

3 SYS A&B ASC FUEL & OXID (4) - bp
SYS A&B QUAD 1,4,2,3(8) - gray
CRSFD - bp
SYS A&B MAIN SOV - gray

4 TAPE - bp

✓ ECS ACTIVATION & CHECKOUT

5 min

1 O2/H2O QTY MON - ASC 2, ASC 1, DES

2 SUIT ISOL (Both) - SUIT FLOW
SUIT ISOL (Both) - ACTUATE OVRD (Suit
Discon)
DES O2 - OPEN
SUIT GAS DIVERter - PUSH/CABIN
PRESS REG A&B - EGRESS (Suit Gas Diverter
Automatically Extends & Cabin Fans
Go Off)

Basic Date - Feb. 24, 1969

Changes

LM-3

RDZ-10

SUIT PRESS 4.8 To 5.2 psia ~~4.8 To 5.2~~
CB(16) ECS: CABIN FAN CONT - Open
(Cabin Fans Go On)

SUIT FAN - 2 (Master Alarm, SUIT/FAN
Warning Lt-On Momentarily, ECS Caution
Lt, H2O Sep Comp Lt - On Then Off In
<2min)

PART PRESS CO2 <7.6 mm hg

✓ SUIT FAN/H2O SEP CHECK

2 min

1 CB(16) ECS: SUIT FAN 2 - Open (Master
Alarm, SUIT/FAN Warning Lt, Suit Fan
Comp Lt-On)

2 When ECS Caution Lt & H2O SEP Lt-On
Master Alarm - On

CB(11) ECS: SUIT FAN 1 - Close
H2O SEP SEL - PUSH/SEP 1

SUIT FAN - 1 (SUIT/FAN Warning Lt, Suit
Fan Comp Lt - Out, ECS Caution Lt,
H2O Sep Comp Lt - Out In <2 min)

CB(16) ECS: SUIT FAN 2 - Close

✓ S-BAND AND VHF ACTIVATION

~~4-47-577~~

Set Comm Configuration

S-Band - PM, PRIM, PRIM, VOICE, PCM, RANGE, L/R, LO

VHF - ON, ON, VOICE, ON

S-BAND & VHF ANTENNA - As Desired

AUDIO (Both):

S-BAND - T/R (Vol To Just Hear MSFN)

ICS - T/R

RELAY - OFF

AUDIO CONT - NORM

VOX - ICS

VHF A (CDR) - T/R

(LMP) - OFF

VHF B (CDR) - OFF

(LMP) - T/R

Connect Umbilical To Right Side
(Red/Red - Blue/Blue)

LMP
PTT &
VHF
INDOP

RDZ-11

- 2 CSM Configure Simplex B And Set LMP
Suit Pwr To Off
Connect To LM Comm Umbilical (Audio, Biomed)
TAPE - ON
Conduct COMM Check, Adjust Squelch (ACA & Umbilical PTT)
- 3 AUDIO (LMP): VOX - ICS/XMTR
Conduct Comm Check (Adjust VOX SENS)
VOX - ICS
- 4 CSM Configure For Simplex A
AUDIO (LMP): VHF A - T/R
VHF B - OFF
Conduct COMM Check, Adjust Squelch
- 5 CSM Configure For LM Data
VHF B XMTR - DATA
VHF B RCVR - OFF
TELEMETRY - LO
- 6 VHF ANTENNA - Select Other Antenna
Perform COMM Check With CSM
- 7 CSM Select Other Antenna
Perform COMM Check With CSM
- 8 VHF ANTENNA - Select Original Antenna
Conduct COMM Check
TAPE - OFF
- 9 Select Best Antenna Combination

Basic Date Feb. 24, 1969
Changed

Basic Date Feb. 24, 1969
Changed

LM-3

RDZ-12

CDR TRANSFER & CREW CONNECT

10 min

CSM Set LMP Suit Flow Control To Off
LMP SUIT ISOL - SUIT FLOW (Verify Flow)
Disconnect Umbilical And Pass To CSM
Receive And Stow ISA
LMP Configure Cabin (Straps, Utility
Lights, Cards, Restraints, etc.)

CDR Transfer To LM With CDR RDZ Checklist
Connect To CDR Hoses (Red/Red, Blue/Blue)
CDR SUIT ISOL - SUIT FLOW
Connect To LM Comm Umbilical (Audio, Biomed)
Conduct Comm Check (ACA & Umbilical PTT)

CDR AUDIO: VOX - ICS/XMTR
Conduct Comm Check (Adjust VOX SENS)

CDR AUDIO: VOX - ICS

OPS CHECK

CDR HTR CHECK NO GOOD
5 min

OPS 02 PRESS 5380 To 6380 psi
02 HOSE - LOCKED
OPS 02 - ON (02 Press 3.4 To 4.0 psi)
Verify 02 Flow
HEATER TEST BUTTON - DEPRESS
(At Least 1 Lt - On)
OPS 02 - OFF
Verify REG Press Gage Reads Zero
In About 4 min

STOW OPS (Both On Pallet)

DROGUE AND PROBE INSTALLATION

10 min

Both Electrical Umbilicals Disconnect,
And Secured
Drogue Lock Lever Engaged And Flush
Three Capture Latches Engaged and Locked
(Before & After Preload)

RDZ-13

LM Hatch Exterior Insulation OK, Flaps Secured

Close & Secure Hatch
CABIN DUMP VALVE - AUTO
CABIN REPRESS - AUTO
PRESS REG A&B - CABIN
SUIT GAS DIVERter - PUSH/CABIN
CB(16) ECS: CABIN FAN CONT - Close

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Changed

Changed

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LM P NOT ON LOUP DUE TO RIGHT EAR NOT CLEARING

LM-3

RDZ-14

✓
GLYCOL PUMP CHECK

5 min

1 CB(11) ECS: GLYCOL PUMP 1 - Open (Master Alarm, And ECS Caution Lt On Momentarily)
2 CB(11) ECS: GLYCOL PUMP 1 - Close, (Check Glycol Comp Lt-On)

2 GLYCOL - INST(SEC) (Note Glycol Press)
CB(16) ECS: GLYCOL PUMP SEC - Close (10-20 psi Rise) ~~10-20~~ 15 AP
ECS: GLYCOL PUMP SEC - Open

3 GLYCOL - PUMP 2 (15-30 psi)
CB(11) ECS: GLYCOL PUMP AUTO TRNFR - Open
GLYCOL - PUMP 1 (Master Alarm & ECS Caution Lt On Momentarily, 15-30 psi)
CB(11) ECS: GLYCOL PUMP AUTO TRNFR - Close

ARS/PGA PRESSURE INTEGRITY CHECK

5 min

SUIT GAS DIVERter - PULL/EGRESS
CABIN GAS RETURN - EGRESS
SUIT CIRCUIT RELIEF - CLOSE
PRESS REG A - CLOSE
PRESS REG B - DIRECT O2 (Suit Press To 8.85 psia)
PRESS REG B - CLOSE (Monitor Cuff Gage Decay <.3 psi In 1 min)

CO2 CANISTER SEL - SECONDARY (CO2 Comp Lt - On Monitor Cuff Gage Decay at <.3 psi In 1 min)

CO2 CANISTER SEL-PRIMARY(CO2 Comp Lt-Off)
SUIT CIRCUIT RELIEF - AUTO
PRESS REG A&B - CABIN
CABIN GAS RETURN - AUTO
SUIT GAS DIVERter - PUSH/CABIN

RDZ-15

ASCENT BATTERY ACTIVATION & CHECKOUT 2 min

1 CB(16) EPS: ASC ECA CONT - Close
2 CROSS TIE BAL LOADS - Open

3 POWER/TEMP MON - BAT 5
4 BAT 5 NORMAL FEED - ON tb-gray
5 Verify BAT Current Then BAT & SE
6 BUS Voltage
7 BAT 1,2 HI VOLT - OFF/RESET tb-bp
8 (Possible Master Alarm and DC BUS
Warning Lt - On)

POWER/TEMP MON - BAT 6
BAT 6 BACKUP FEED - ON tb-gray
Verify BAT Current Then
BAT & SE BUS Voltage
BAT 5 NORMAL FEED - OFF/RESET tb-bp

POWER/TEMP MON - BAT 1
BAT 1,2, HI VOLT - ON
BAT 6 BACKUP FEED - OFF/RESET tb-bp

POWER/TEMP MON - BAT 6
BAT 6 NORMAL FEED - ON tb-gray
Verify BAT Current Then BAT & CDR
BUS Voltage
BAT 3,4 HI VOLT - OFF/RESET tb-bp
(Possible Master Alarm And DC BUS
Warning Lt - On)

POWER/TEMP MON - BAT 5
BAT 5 BACKUP FEED - ON tb-gray
Verify BAT Current Then BAT & CDR
BUS Voltage
BAT 6 NORMAL FEED - OFF/RESET tb-bp

POWER/TEMP MON - BAT 4
BAT 3, 4 HI VOLT - ON tb-gray
BAT 5 BACKUP FEED - OFF/RESET tb-bp

CB(16) EPS: ASC ECA CONT - Open
CROSS TIE BAL LOADS - Close

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RDZ-15/16

ASCENT BATTERY ACTIVATION & CHECKOUT

1 CB(16) EPS: ASC ECA CONT - Close

2 POWER/TEMP MON - BAT 5
3 BAT 5 NORMAL FEED - ON tb-Gray
4 Verify Bat Current

POWER/TEMP MON - BAT 6
BAT 6 NORMAL FEED - ON tb-Gray
Verify Bat Current

BAT 1,2,3,4 HI VOLT - OFF/RESET tb(4)-bp
Verify Bats 1,2,3,4 Current Zero

BAT 5,6 BACKUP FEED - ON tb(2)-Gray
BAT 5,6 NORMAL FEED - OFF/RESET tb(2)-bp
Verify Bat 5,6 Current

BAT 1,2,3,4 HI VOLT - ON tb(4)-Gray
Verify Bat 1,2,3,4, Current
BAT 5,6, BACKUP FEED - OFF/RESET tb(2)-bp
Verify Bat 5,6 Current Zero

CB(16) EPS: ASC ECA CONT - Open

REPORT ED BAT VOLTAGE TO MSFN
BAT A 36.8 BAT B 37.5

BUSSES 29.0 VDC
ON ASC BATT

PGNS TURN ON & SELF TEST

If STBY Lt-On, PRO
V36E

V21N01E, 3000E, 2176E, E
3011E, 201E, E
1642E, 3777E

V66E

CB(11) PGNS IMU OPR - Close (NO ATT
Lt-On For 90 sec)

V35E

F 88 88

DSKY LIGHT CHECK
(Master Alarm, LGC, ISS Warning
And All DSKY Lights - On For 5 sec)
Key RSET
When NO ATT - Off +20 sec, V37E00E

V25 N01E, 1365E
E,E,E

F 21 01

V15 N01E, 1365E
R1, R2, R3 All Zero

15 01

V21 N27E, 10E INITIATE SELF TEST

KEY REL

15 01

R1 Number Of Errors
R2 Number Of Tests Started
R3 Number Of Tests Successful
(Test Successful When R2 \geq 3)(78 sec)

*PROG Lt - On *
V05N09E 01102 Self Test Error
*N08E Record For MSFN *
* R1 *
* R2 *
* R3 *

V21 N27E OE TERMINATE TEST

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LM-3
LM-3

8

RDZ-17 ON LGC/DSKY
CB- CLOSE WE
5 min
WERE NOT IN
STBY- INSTEAD
F37 P06

RDZ-18
AGS ACTIVATION, SELF TEST 2 min

AGS STATUS - STBY
 CB(16)STAB/CONT: AEA - Close
 AGS STATUS - OPERATE
 (Master Alarm & AGS Warning Lt - On,
 Then Off)
 6666 (OPR ERR - On)
 000+88888
 123 - 45679
 412R + 1 SELF TEST SATISFACTORY
 + 3 LOGIC TEST FAILURE
 + 4 MEMORY TEST FAILURE
 + 7 LOGIC AND MEMORY TEST FAILURE
 (To Reinitiate Test Set 412 + 0)
 574R (+) DESCENT STAGE FLAG (+Not Staged)
 604R(+) LUNAR SURFACE FLAG (+Not On
 Lunar Surface)
 612R(+0000) STAGING SEO COUNTER (+00000
 For Att Hold At Abort Stage)

RATE GYRO CHECK 89:52 2 min

RATE SCALE - 25°/SEC
 GYRO TEST - POS RT (Roll Rate +5°/sec)
 GYRO TEST - NEG RT (Roll Rate -5°/sec)
 GYRO TEST - PITCH (Repeat Test)
 GYRO TEST - YAW (Repeat Test)
 RATE SCALE - 5°/SEC
 Repeat Tests

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LM-3

90:32 - 90:38

RDZ-19
**LM DOCKED IMU ALIGNMENT 7 min

Verify CSM In MIN DB ATT HOLD Until
 Coarse Align Complete

Calculate LM Gimbal Angles:

OG	IG	MG
300.26	090.00°	
+ 2.10		
302.36		
- 147.49	+ 290.00	- 360.00
+ 154.87	+ 020.00	+ 13.29
LM	LM	LM

V41 N20E COARSE ALIGN IMU
 LOAD ICDU ANGLES OG, IG, MG (.01°)
 (NO ATT Lt - On, FDAI Torques)
 *PROG Lt - on *
 *V05N09E 00211 COARSE *
 * ALIGN ERROR, GO *
 * TO 3 *
 V40 N20E ZERO CDU (NO ATT Lt - Off)
 Notify CSM ATT HOLD No Longer Required

V25 N07E
 SET REFSMFLG
 77E, 10000E, 1E
 V01 N01E, 77E, Confirm Bit 13 Set
 V37E51E, PRO, V37E00E

RDZ-20

06 20 V06 N20
On CSM MARK - ENTR
Copy OG, IG, MG, CSM & LM

OG	IG	MG
147.35 CM	289.80 CM	346.53 CM
154.76 LM	019.07 LM	013.05 LM

Voice Angles To MSFN

Copy Ground Calculated Gyro Torquing Angles

91:06 X-00370, Y-00790, Z-00310

9 V42E FINE ALIGN IMU 3 min
F 21 93 LOAD GYRO TORQUING ANGLES X,Y,Z (.001°)

10 V16 N93E
F 16 93 MONITOR TORQUING

LGC CLOCK INITIALIZATION

8 min

1 5024 V37E 00E 90:00:00
2 5040
-16
-12
3 0188
0211
-23
1037
4 1051
-14

V25 N36E Load CSM Time But Do Not ENTR
Seconds, On CSM MARK - ENTR

V06 N65 ON CSM MARK - ENTR
COMPUTE CSM/LM Δ TIME
Perform Several Times Then

V55E LOAD Δ TIME

✓ SET TEPHEM

90:03:00

2 min

1 00007 CSM V05 N01E, 1706E And Read TEPHEM
35016
2 31153 V25 N01E, 1706E (Load TEPHEM) E
3 V05 N01E, 1706E Verify TEPHEM

RDZ-21

✓
DPS, RCS TEMP/PRESS CHECK,
APS PRESSURIZATION

4 min

PRPLNT QTY MON - DES 1, DES 2, Then OFF
(Reading Not Valid)

PRPLNT TEMP/PRESS MON

DES 2&1 (50°-75°F, 238-253 psi)
ASC (50°-90°F, 80-200 psi)

HELIUM MON

DES AMB PRESS (238-253 psi)
DES SUPCRIT PRESS (1320-1435 psi)
ASC TEMP 1&2 (30°-140°F)
ASC PRESS 1&2 (2720-3500 psi)
OFF

ASCENT He REG 1&2-Open tb(2)-gray
ASC He SEL - BOTH
MASTER ARM - ON
ASC He PRESS - FIRE
MASTER ARM - OFF (Master Alarm - On)

PRPLNT TEMP/PRESS MON 68-68 190-190
ASC TEMP/PRESS (50°-90°/172-203 psi)
DES 1 63-63 2840-2820-HC

RCS QUANTITY A&B 95 98-97
RCS TEMP/PRESS MON: 2800-2780
He (2475-3325 psi) 67-68
PRPLNT (40°-100°F) (178-192 psi) 180-180
FUEL MANF (175-189 psi) 182-180
OXID MANF (175-189 psi) 182-181
He 88-87

HTR: RCS TEMP MONITOR - QUAD 1,2,3,4
(120°-190°F)

RCS SYS A&B ASCENT FEED 2 (2) - CLOSE
RCS SYS A&B ASCENT FEED 1 (2) - OPEN
ASC FUEL & ASC OXID tb(4) Remain bp

90:31 ✓

RDZ-22

RCS COLD FIRE

8 min ~ 4

1 CSM MIN DEAD BAND And ATT HOLD
 X-TRANSL - 4 JETS
 Verify QUAD TEMP ~~120°F~~ 120°F
 SYS A&B QUAD ISOL (8)-OPEN tb-gray
 ATTITUDE CONTROL (3)-MODE CONT
 MODE CONTROL-ATT HOLD

2 V48E LOAD DAP, 02012E

3 V77E
 V15 N10E, 42E
 CDR ACA (To Soft Stop)
 Roll Right - R3 00051
 Roll Left - 77726
 Pitch Up - R1 00051
 Pitch Down - 77726
 Yaw Right - R2 77726
 Yaw Left - 00051

4 LMP Repeat Test

5 V11 N10E, 5E
 CDR ACA
 Roll Right - R1 00245
 Roll Left - 00132
 Pitch Up - R1 00226
 Pitch Down - 00151
 CDR TTCA
 Up - R1 00252
 Down- 00125

6 LMP Repeat Test

7 E6E
 CDR ACA
 Yaw Right - R1 00252
 Yaw Left - 00125
 CDR TTCA
 Right - R1 00220
 Left - 00140
 Fwd - R1 00011
 Aft - 00006

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LM 2
 LM 3

RDZ-23

8 LMP Repeat Test

9 V76E, V11 N10E, 31E R1 67777
 CDR ACA
 Roll Right - R1 27757
 Roll Left - 27737
 Pitch Up - R1 27776
 Pitch Down - 27775
 Yaw Right - R1 27767
 Yaw Left - 27773

10 LMP Repeat Test

11 MODE CONTROL - AUTO R1 57777

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6
7

✓
09200 :00 : : :
- 027.99 : : :
+ 146.31 : : :
+ 0124.5 : : :
NAV
H CHECK

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Changed -

LM-3

RDZ-24

✓ **ERASABLE MEMORY DUMP

1 min

1
TLM-HI → CB(11) R/D INST B - Close
Verify MSFN Contact
V74E (42 sec - 2 Dumps)

✓ **REFSMMAT AND STATE VECTOR UPDATE

3 min

1 V37E 00E
2 MSFN Uplink REFSMMAT & State Vector And
Nav Check Pad
(Unlink Acty Lt - On Then Off When
Uplink Completed)

✓ **GIMBAL DRIVE AND THROTTLE TEST

4 min

THR CONT - MAN
MAN THROT - SE
TTCA (Both) - THROTTLE(UP)MIN POSITION
2 Verify MSFN Contact
V48E
F 01 46 DAP CONFIGURATION
R1 02012
PRO
3 F 06 47 LM WT, CSM WT
R1 22145
R2 27009 (1b)
PRO
4 F 06 48 ENGINE GIMBAL TRIM, PITCH, ROLL (.01°)
R1 +00428 ~~00000~~ (+00458)
R2 +00730 ~~00000~~ (+00731)
Verify MODE CONTROL - AUTO
ENGINE GIMBL - ENABLE
ENGINE ARM - DES
PRO (Master Alarm, GDA/RCCA Warning Lt-On
When Gimbals Reach Limits)

8
9
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5 TTCA (LMP) - MIN, Then SOFT STOP (51%)
Then MAX (Off Scale High) Then MIN
MAN THROT - CDR
6 TTCA (CDR) - MIN, Then SOFT STOP
(51%) Then MAX (Off Scale High) Then MI

THR CONT - AUTO

7 F 50 48 TRIM COMPLETE
ENG ARM - OFF(GDA/RCCA Warning Lt-Off)
TTCA (Both) - JETS (DN)
PRO
MSFN Verifies Final GDA Position; If
Gimbal Angles Differ From Desired
Values By More Than 0.1° Repeat V48

8 CB(11) STAB/CONT: DECA PWR - Open
CB(14) STAB/CONT: DES ENG OVRD - Open

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Changed _____

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Changed _____

✓ **RCS HOT FIRE

91:18 - 91:21 5 min

1 Notify CSM
Verify HBR With MSFN
Verify RCS OOAD TEMP 1,2,3,4 120°-190°F
For At Least 25 min
CB(16) INST: CWEA - Open & Reclose
(Master Alarm - On)
GUID CONT - AGS
X-TRANSL - 4 JETS
DEAD BAND - MAX
ATTITUDE CONTROL (3) - MODE CONT
MODE CONTROL - ATT HOLD

2 CDR ACA (Deflect Slowly To Soft Stop,
Pause At Null)
Roll Right, Left, Pitch Up, Down, Yaw
Right, Left. (Possible Master Alarm,
RCS TCA Caution Lt - On tb - red)
Verify MSFN Read RCS Data

ATTITUDE CONTROL (3) - PULSE
CB(11) STAB/CONT: ATT DIR CONT - Close
CDR ACA (Deflect Hardover, Pause at Null)
Roll Right, Left, Pitch Up, Down, Yaw
Right, Left (Possible Master Alarm,
RCS TCA Caution Lt - On, tb - red)

4 CB(11) RCS: SYS A OOAD 4,3,2,1 - Close
CB(16) RCS: SYS B OOAD 1,2,3,4 - Close
CB(16) INST: CWEA - Open & Reclose
CDR TTCA
Up, Down, Right, Left, Fwd, Aft

5 V76E
GUID CONT - PGNS
CDR TTCA (Pause at Null)
Up, Down, Right, Left, Fwd, Aft
Standby For MSFN GO

6 X-TRANSL - 2 JETS
DEAD BAND - MIN

7 Set DAP - 01002

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90:46-90:52

RDZ-27

REGULATOR CHECK

10 min

MI

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LM

1

Verify CSM Tunnel Hatch Is Closed,
Tunnel Depressed

2

CABIN GAS RETURN - EGRESS
CABIN REPRESS - AUTO
PRESS REG B - EGRESS (Cabin Fans - Off
And Suit Gas Diverter - Egress)

3

FWD CABIN DUMP VALVE - OPEN Then AUTO At
4.0psi (Master Alarm, CABIN Warning Lt
And Auto Cabin Repress - On At 4.45 psi)

4

As Soon As Cabin Repress Starts
PRESS REG A - CLOSE
(CABIN Warning Lt - Off, Cabin Repress
Stops)

5

CABIN REPRESS - CLOSE
FWD CABIN DUMP VALVE - OPEN Then AUTO At
3.5 psi (Verify Suit Press 3.6 To 4.0 psi)

6

PRESS REG B - CLOSE (Possible Master Alarm,
CABIN Warning Lt On Momentarily &
Cabin Fans-On)

7

SUIT CIRCUIT RELIEF - OPEN Then AUTO At
Suit Press of 3.5 psi

PRESS REG B - EGRESS (Suit Press 3.6 To
4.0 psi Master Alarm & CABIN Warning
Lt - On Momentarily, Cabin Fans - Off)

8

PRESS REG B - CLOSE (Master Alarm, CABIN
Warning Lt On Momentarily & Cabin
Fans - On)

9

SUIT CIRCUIT RELIEF - OPEN Then AUTO At
Suit Press of 3.5 psia

PRESS REG A - EGRESS (Suit Press 3.6 To
4.0 psi Master Alarm, CABIN Warning Lt -
On Momentarily, Cabin Fans - Off)

10

CABIN REPRESS - AUTO

11

PRESS REG B - CABIN (Master Alarm, CABIN
Warning Lt, Cabin Fans-On, Suit & Cabin
Press Rises To 4.6 To 5.0 psi)

10

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RDZ-28

8

PRESS REG A - CABIN
CABIN GAS RETURN - AUTO
SUIT GAS DIVERter - PUSH/CABIN

✓ PIPA BIAS CHECK 90:44 - 90:45 3 min

- 1 DET - ZERO
Request CSM Null Rates <.1°/sec
Request CSM Go CMC MODE - FREE
- 2 V25N21E, E, E, E/Start DET
- 3 V06E
06 21 XYZ PIPA PULSES (+pulses)
- 4 At T+32sec - ENTR
T+32sec(X)R1 + ~~09~~ 09 (+XXXAB)
(Y)R2 + 01
(Z)R3 + 01
Notify CSM Test Complete
- V06N01E, 1452E (R1-Review X Bias)E (+AB000)
1454E (Review Y Bias)E
1456E (Review Z Bias)
- V21 N01E
F 21 01 LOAD 1452E(Calculated X BIAS)E,E (+AB000)+12
1454E(Calculated Y BIAS)E,E - 3
1456E(Calculated Z BIAS)E + 1
(Use Same Sign As In Measured Bias
of Step 4)

✓ AGS INITIALIZATION

3 min

1 AGS In Operate for 25 min
SET AGS TIME (BIAS 90 hr.)
UPDATE AGS
ALIGN AGS
Check 403(Hp) & 315(Ha) With V82E

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LM-3

RDZ-29

✓ AGS CALIBRATION

9 min

1

Read And Record

540R X ACCEL BIAS COEFF + 0 (Octal)
541R Y ACCEL BIAS COEFF + 0 (Octal)
542R Z ACCEL BIAS COEFF - 7777 (Octal)
544R X GYRO DRIFT COEFF + 7 (.01°/hr)
545R Y GYRO DRIFT COEFF + 28 (.01°/hr)
546R Z GYRO DRIFT COEFF + 0 (.01°/hr)

2

Verify AGS In Standby/Operate For 25 min,
PGNS-ON, LM Thrusters Disabled,
Rates <.1°/sec, RPY ICDUS Torqued
Beyond 11.25° And Will Not Pass Thru 0°
45°, 90°, etc. (CSM OG=82.5°, IG=22.5°,
MG=22.5° Will Give The Starting Attitude)

3

CSM Establish AGS Calibration Attitude,
Minimize Rates, Go CMC MODE - FREE

V16N20E Monitor ICDU Angles (All Angles
should be Approx. 22°, 67°, 112°, 157°,
202°, 247°, 292°, or 337°)

LM ICDU's: ~~00~~ 112.5°

~~16~~ 202.5°

~~16~~ 022.5°

FDAI ANGLES: R 132.7°

P 339.8°

Y 301.4°

4

V40 N20E ZERO CDU

5

400 + 6E CALIBRATE GYRO & ACCEL

Read And Record After 32Sec

540R X ACCEL BIAS COEFF + 0 (Octal)
541R Y ACCEL BIAS COEFF + 0 (Octal)
542R Z ACCEL BIAS COEFF - 7777 (Octal)
(If BIAS Changes > 4 Counts, AGS Failed)

6

If It Appears that The Gimbal Angles Will
Pass Thru 0°, 45°, 90°, 135°, 180°,
225°, 270°, or 325°, Exit Calibration By
400+0E

7

400R + 0 When GYRO & ACCEL CALIBRATE COM-
LETE

11

12

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16

RDZ-30

8

Read And Record After 5 min 2 sec

544R X GYRO DRIFT COEFF $+ 19$ (.01°/hr)545R Y GYRO DRIFT COEFF $+ 13$ (.01°/hr)546R Z GYRO DRIFT COEFF $- 1$ (.01°/hr)(If GYRO DRIFT $> 2.50^\circ/\text{hr}$, AGS Failed)

CHANGES

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RDZ-31

LANDING RADAR SELF TEST

4 min

1

X-POINTER (Both) - HI MULT
 RATE/ERR MON-LDG RDR/CMPTR
 TEMP MON - LDG RDR ($> 49^\circ\text{F}$) (---)
 RNG/ALT MON - ALT/ALT RT
 LDG ANT - DES
 MODE SEL - LDG RDR
 CB(11) PGNS: LDG RDR - Close
 (X-POINTER Will Oscillate Then
 Up And Right Off Scale)

2

RADAR TEST - LDG (Alt And Alt Rt Tapes Drive)

TEST MONITOR-ALT XMTR(2.1 To 5.0V)(3.6V)(3.7)-VEL XMTR(2.1 To 5.0V)(3.8V)(3.75)ALT/ALT RT MON - +8094 To +8457 ft/-433 To
-465 fps (8280/-450) ($8290/-450.5$)

3

LDG ANT - HOVER (10 sec)

ALT/ALT RT+7818 To +8169 ft/-441 To -457 fps
(8000/-450) ($8000/-450.5$)

4

LDG ANT - DES (Wait 10 sec)

5

V62E INITIATE RDR SELF TEST

F 04 06

R1 00004 SPECIFY RDR

R2 00002 LDG RDR

PRO

6 F 16 66

SLANT RANGE, ANT POSITION

R1 +08165 To +08418 (08286)

R2 +00001

PRO

7 F 16 67

LDG RDR VEL X, Y, Z

R1 -00230 To -00264 (-00246)

R2 +00924 To +00954 (+00930)

R3 +00643 To +00689 (+00666)

8

V34E

9

LDG ANT - AUTO

11

12

13

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15

16

RDZ-32

10 V61 COMMAND ANT TO POS 2 (27 sec)
ALT/ALT RT MON - +7818 To +8169ft/-441 To
-457 fps (8000/-450) (8000/-450.5)

11 F 04 06 V62E INITIATE RDR SELF TEST
R1 00004 SPECIFY RADAR 8281
R2 00002 LDG RDR
PRO + 2

12 F 16 66 SLANT RNG, ANT POSITION (ft)
R1 + 08156 To +08418 (08292)
R2 00002
V34E 8000
- 450.5

13 RADAR TEST - OFF
CB(11) PGNS: LDG RDR - Open
(Master Alarm - On)

✓ RNDZ RDR SELF TEST 10 min
AND SET FOR UNDOCKING

1 Verify CSM RCS Thruster B3 And Transponder
OFF
RDZ ANT - Released
X-POINTERS (Both) - HI MULT
RATE/ERR MON (Both) - RNDZ RADAR
ATTITUDE MON (Both) - PGNS
MODE SEL - LDG RADAR
RNG/ALT MON - RNG/RNG RATE
SHFT/TRUN - +50°
RDZ RDR - SLEW
TEMP MONITOR - RNDZ (+10° To 150°)

2 CB(11) AC BUS A: RNDZ RDR - Close (Wait
30 sec)
PGNS: RNDZ RDR - Close (NO TRACK Lt - On)

3 SLEW LEFT TO 0°, 0°
SLEW RATE - LO
SHFT/TRUN +5°
Slew Antenna Up, Dn, Left, Right To
Verify Slew

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LM-3

RDZ-33

4 RDZ RDR - AUTO TRACK (Master Alarm & RNDZ
RDR Caut Lt - On)
RADAR TEST - RNDZ (Rng Rt. Tape Drives,
X-Pointers And FDAI Needles Vary Between
Limits. After 12sec, Rng Tape Drives,
NO TRACK And RNDZ RDR Caut Lt - Out)

5 TEST/MONITOR-AGC 0.7 To 3.5v(1.5)(1.6)
-XMTR PWR 2.1 To 4.8v(2.8)(3.1)
-SHAFT ERR 1.5 To 3.5v(1.5 - 1.8)
(2.2 - 2.6) 2.2 2.6
-TRUN ERR 1.5 To 3.5v(1.6 - 1.7)
(2.3 - 2.5) 2.2 2.4
-AGC

RDZ RDR - SLEW
Slew Antenna To 0°, 0°
RDZ RDR - LGC (NO TRACK Lt - On)

6 V62E START RDR SELF TEST
F 04 06 R1 00004 SPECIFY RADAR
R2 00001 RNDZ RADAR
PRO
NO TRACK Lt - Out After 12 sec

7 F 16 72 RR TRUNNION AND SHAFT
R1 Varying @ 1/2 cps
R2 Varying @ 1/2 cps
PRO

8 16 78 RANGE, RANGE RATE
R1 +18900 To +19800 (+19571)(195.75)
R2 -00459 To -00541 (-00495)(-495)
RNG/RNG RT MON - +189 To +198 nm/-459 To
-541 fps (196/-493) (195.5 / -493.5)

9 V34E
RADAR TEST - OFF (NO TRACK Lt-On, X-PNTR-
Center)

11 V40N72E RR CDU ZERO (10 sec)

12

13

14

15

16

RDZ-34

12 V41N72E
N73 R1+04000
R2+04000
N06 R2 00002
V16N72E (Verify FDAI Needles Up & Right
V44E (TERM DESIG)

13 V41 N72E
N73 R1-00400
R2-00400
N06 R2 00002
V16 N72E (Verify FDAI Needles)
V44E (TERM DESIG)

14 V41N72E
N73 R1+00000
R2+00000
N06 R2 00002
V16N72E (Verify FDAI Needles)
V44E (TERM DESIG)

15 V41N72E
N73 R1+00000
R2+32300
N06 R2 00002
V16N72E
CB(11) PGNS: RNDZ RDR - Open
AC BUS A: RNDZ RDR - Open
V44E (TERM DESIG)

16 ADVISE CSM RR CHECK COMPLETE
CSM ACTIVATE RR XPNDR

Basic Date Feb. 24, 1969
Changed
Changed

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Changed
Changed

LM

RDZ-35

LIGHTING CHECK

2 min

1 EXTERIOR LTG - TRACK, DOCK, OFF
Verify Operation In Each Position
Mount COAS In FWD Window And Check
3 CB(11) AC BUS B: AOT LAMP - Close
Verify Operation
CB(11) AC BUS B: AOT LAMP - Open

*PREP FOR UNDOCKING

2 min

1 Configure Cameras:
Seq Camera (CEX368 Mags (L) (T is Stowed),
5mm Lens, f11, 1/250, 6 fps)
STD Hasselblad CEX368 Mags (F) (G is Stowed),
f11, 1/250, Handle, Focus As Required)

2 CSM Configure For Duplex A & RCV ONLY-A
LM Configure For Basic Comm With VHF B
Backup
AUDIO (Both): VHF B - RCV
VHF B XMTR - VOICE
VHF B RCVR - ON

3 Mount Phasing Pad
DET - SET (Set for RCS Sep Time)
Overhead Hatch - Locked
OVHD DUMP VALVE - AUTO
PRESS REGS A&B - CABIN
LIGHTING: EXTERIOR - DOCK

4 ATTITUDE CONTROL (3) - PULSE
GUID CONT - AGS
MODE SEL - LDG RADAR
RNG/ALT MON - RNG/RNG RT
RATE/ERR MON (Both) - LDG RDR/CMPTR
ATTITUDE MON (Both) - AGS
SHFT/TRUN - +5°
X-POINTER - HI MULT

5 ENG ARM - OFF
X-TRANSL - 2 JETS

12

13

14

5

-E

RDZ-36

BAL CPL - ON
DEAD BAND - MIN
MODE CONTROL - ATT HOLD
TTCA (BOTH) - JETS
RNDZ RDR - LGC

Verify Undocking Attitude As:

ICDU ANGLES: ~~064~~ 120°

~~IGP~~ 196°

~~MGP~~ 000°

FDAI ANGLES: R 180°

P 016°

Y 300°

CB(11) R/D INST A - Close

Basic Date _____
Changed _____
Feb. 24, 1969


Basic Date _____
Changed _____

CONFIGURE PGNS & AGS

5.00

1 SET DAP V48E

N46 01011E

N47 LM WT 

2 V37E 00E

V76E

MODE CONTROL - ATT HOLD

3 V37E 30E

N33 _____ TIG (100:26:00) (101:27:00)

N82 _____ +Vx(LV) (+41590) (-41590)

_____ +Vy(LV) (-49602) (-49602)

_____ +Vz(LV) (+00400) (+00400)

N42 _____ HA

_____ HP

_____ HV

N45 M, TFI, MGA

410 + 5E EXTERNAL /V

450 + _____ E

451 + _____ E

452 + _____ E

267 R → 411 +1E APS BURN

400 +1E GUIDANCE STEERING

500R


Verify Both ENG STOP pd - Reset

PIPA BIAS CHECK

5.00

1 DET - Zero

Request CSM Null Rates <.1 /sec

Request CSM Go CMC MODE 

V25N21E, E,E,E/Start DET

V06E

06 21 XYZ PIPA PULSES

(continues)

Basic Date Feb. 24, 1969
Changed _____

LM-3

3

13

14

15

16

RDZ-38

At T+32 sec - ENTR

T+32 sec (X)R1 _____

(Y)R2 _____

(Z)R3 _____

(+XXXAB)

Notify CSM Test Complete

V06 N01E, 1452E (R1-Review X BIAS)E(+AB000)

1454E (Review Y BIAS)E

1456E (Review Z BIAS)

V21 N01E

LOAD 1452E(Calculated X BIAS) E,E (+AB000)

1454E(Calculated Y BIAS) E,E

1456E(Calculated Z BIAS) E

(Use Same Sign As In Measured Bias
Of Step 4)

PREP FOR TRANSFER

40 min

Stow the following in ISA:

CDR RDZ Procedures

LMP Rndz Charts & Procedures

EVA Checklist (1) ~~GEN~~ **DICTIONARY**

All Exposed And Unexposed Film (2/16mm)

Mags (L)&(T), 2/70mm Mags (F)&(G)

STD Hasselblad ~~5mm Lens~~

SEQ Camera ~~5mm Lens~~

Camr Handle

Radiation Survey Meter

Passive Radiation Dosimeter

Verify Tunnel Pressurized With CSM

PRESS REGS A&B - EGRESS

OVHD CABIN DUMP VALVE - OPEN

Stow OPS On Floor

Stow Helmet Stowage Bags On Deck

~~Unstow PLSS, Remove LIOH Cartridge~~

~~And Stow In Bag~~

~~Stow PLSS On CDR Side Wall~~

Open Hatch

OVHD CABIN DUMP VALVE - AUTO

Remove Drogue And Probe And Stow On
LMP Side Wall

Basic Date Feb. 24, 1969

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Basic Date

Changed

RDZ-39

CDR TRANSFER TO CSM UMBILICAL

5 min

~~Connect To CSM Umbilical~~

CDR SUIT ISOL - SUIT DISC

~~CSM Set LMP Suit Flow Control To Suit Flow~~

~~and Audio Suit Power - OFF~~

~~Connect To CSM Comm LMP (Audio, Biomed)~~

~~Notify CSM Then Conduct Comm Check~~

Disconnect LM Hoses And Stow

CDR Transfer To CSM with ISA & CDR RDZ

Checklist

Docking Tunnel Index Angle $\Delta\phi$ _____

Unstow PLSS, Remove LIOH

Cartridge, ~~Stow In Bag~~ ~~Press To CSM~~
Stow PLSS On CDR Side Wall

Basic Date Feb. 24, 1969

Changed

Basic Date

Changed

LM-2

RDZ-40

LM SWITCH CLOSEOUT FOR JETTISON

1 min

ORDEAL:

LTG - OFF

MASTER ARM - ON

CDR AUDIO:

S-BAND T/R - OFF

RELAY - OFF

GUID CONT - PGNS

THR CONT - AUTO

MAN THROT - CDR

ENG ARM - OFF

ASC He REG 1&2 tb-gray

ABORT And ABORT STAGE - Flush/Guarded

SYS A&B ASC FUEL & ASC OXID (4)-tb-bp

SYS A&B QUAD 1,2,3,4 (8) - tb-gray

CRSFD - tb-bp

SYS A&B MAIN SOV - tb-gray

ATTITUDE MON - AGS (LMP)

GLYCOL - PUMP 1

O2/H2O QTY MON - C/W RESET

ATTITUDE CONTROL (3) - MODE CONT

MODE CONTROL - ATT HOLD

RCS SYS A/B-2 QUAD 1,2,3,4 - AUTO

EXTERIOR LTG - ~~ON~~ OFF

Basic Date - Feb 24, 1969

Changed 6

LM 02

RDZ-41

7 ACA/4 JET (2) - ENABLE
TTCA/TRANSL (2) - ENABLE

8 INVERTER - 2

~~BAT 5&6 NORMAL FEED (2) - ON~~

BAT 5&6 BACKUP FEED (2) - ~~tb-bp~~ ON tb-gray

~~BAT 5&6 NORMAL FEED (2) - OFF/RESET tb-bp~~

9 AUDIO (LMP) S-BAND T/R - OFF

RELAY - OFF

10 S-BAND - PM, PRIM, PRIM, OFF, PCM,

RANGE, OFF, HI

TAPE - OFF tb-bp

S-BAND - FWD ~~tb-bp~~

11 SUIT GAS DIVERter - PULL/EGRESS

CABIN REPRESS - CLOSE

PLSS FILL - CLOSE

DES 02 - CLOSE

ASC 1 02 - CLOSE

ASC 2 02 - OPEN

SUIT ISOL (CDR) - SUIT DISC

SUIT CIRCUIT RELIEF - AUTO

CABIN GAS RETURN - EGRESS

12 CABIN RELIEF AND DUMP (2) - AUTO

13 DFI PRIMARY - ON, SECONDARY - OFF

12 LMP TRANSFER TO CSM UMBILICALS 4 min

13 1 Connect To CSM Umbilical

LMP SUIT ISOL - SUIT DISC

Request CSM Set LMP Suit Flow Control

To Suit Full Flow And Audio Power - Off

2 Connect To CSM Comm CDR (Audio, Biomed)

Notify CMP Then Conduct Comm Check

VHF - OFF, OFF, OFF, OFF

Disconnect LM Hoses And Stow

PRESS REG A&B - EGRESS

Basic Date 24, 1969

Changed

LM

RDZ-42

3 Remove Tape Recorder & Pass To CSM
~~Receiver And Stow 154 (m) Floor~~

V37E 00E

UPDATE AGS

ALERT 00E

100+1E
267R VERIFY TOTAL A V

V37E 42E

F 50 18

F 50 19

ENTR

CSM MNVRS

Verify Attitude

V37E 00E

Verify CSM Min Deadband

MODE CONTROL - AUTO

SYS A&B ASC FEED 2(2) - OPEN tb(4)-gray

SYS A&B MAIN SOV - CLOSE tb-bp

FINAL CABIN CLOSEOUT

INVERTER - OFF

CB(11)

Row 1: All Open

Row 2: All Open Except:

RCS SYS A: QUAD 4,3,2,1 TCA(4) - Close

Row 3: All Open Except:

INST: SIG CONDOR 1 - Close

STAB/CONT: ATCA (PGNS) - Close

AELD - Close

ENG CONT - Close

Row 4: All Open Except:

HEATERS: RCS SYS A/B-1:

QUAD 4,3,2,1(4) - Close

ECS: GLYCOL PUMP 2&1 - Close

GLYCOL PUMP AUTO TRNFR - Close

COMM: UP DATA LINK - Close

PGNS: LGC/DSKY - Close

IMU STBY - Close

IMU OPR - Close

Row 5: All Open Except:

EPS: BAT FEED TIE (2) - Close

XLUNAR BUS TIE - Close

ASC ECA - Close

Basic Date 24, 1969

Changed

LM-3

15

16

RDZ-43

DC BUS VOLT - Close
R/D INST A - Close
DFI PWR - ON
R/D INST B - Close

3

Row 1:

CB(16)
All Open Except:
RCS SYS B:
QUAD 1,2,3,4 TCA (4) - Close
TEMP/PRESS DISP-FLAGS - Close

Row 2:

POGS DISP - Close
All Open Except:
LTG: FLOOD - Close
TRACK - Close
MASTER ALARM - Close
STAB/CONT: AEA - Close
ENG ARM - Close
ASA - Close
AELD - Close
ATCA - Close
INST: CWEA - Cycle Open Then Close
SIG SENSOR - Close
PCM/TE - Close
SIG CONDR 2 - Close

Row 3:

All Open Except:
COMM: PRIM S-BD PWR AMPL - Close
PRIM: S-BD XMTR/RCVR - Close
PMP - Close

Row 4:

All Open Except:
HEATERS: RCS SYS A/B-2
QUAD 1,2,3,4 (4) - Close
EPS: DISP - Close
DC BUS VOLT - Close
ASC ECA - Close
XLUNAR BUS TIE - Close
BAT FEED TIE (2) - Close

4

Ingress CSM And Secure Hatch

Basic Date Feb. 24, 1969

Changed

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2

3

EMER-1

FIRE/SMOKE IN CABIN (Not In Suit Loop)

PRESS REG A&B - EGRESS
SUIT GAS DIVERter - EGRESS
Check POWER/TEMP MON For Excessive
Current, Remove Power From Affected
Bus

Use Fire Extinguisher As Required
Don Helmets And Gloves

SUIT FAN - Redundant Fan

Combustion Products Should Be
*Considered Toxic. Smoke And *
*Contaminants Must Be Removed *
*From Cabin Before Removing *
Helmets By Purging or Dumping
*Cabin. *

If Fire Persists

Prepare To Dump Cabin (If Ascent
Stage Only, Insufficient O2
Available For Repress)

Visually Perform Suit Integrity Check

CABIN GAS RETURN - EGRESS

CABIN DUMP (Fwd) - Open, Then Auto
At 3.2 psia (Verify Suit Press -
3.6-4.3 psi)

Cabin Dump Valve Open, Until Cabin
Press 0 psi

When Fire Goes Out

SUIT GAS DIVERter - PULL/EGRESS

SUIT CIRCUIT RELIEF - AUTO

CABIN GAS RETURN - EGRESS

CO2 Canister - MID Position

PRESS REG B - EGRESS

PRESS REG A - DIRECT O2 (Until ARS
Clear; Suit Press Will Increase To
About 5.8 psia)

CO2 Canister Sel - PRIM

15

16

EMER-2

FIRE/SMOKE IN SUIT LOOP (MAY BE IN CABIN ALSO)

1 SUIT ISOL (Both) - SUIT DISC

SUIT FAN - OFF

PRESS REG A&B - CLOSE

- *Combustion Products Should Be Con-
- *sidered Toxic. Smoke And Contam-
- *inants Must Be Removed From Cabin *
- *Before Removing Helmets By Purging*
- *or Dumping Cabin *

Remove Helmet & Gloves

SUIT CIRCUIT RELIEF - CLOSED

CABIN GAS RETURN - EGRESS

SUIT GAS DIVERter - PULL/EGRESS

2 Isolate SUIT LOOP Electrically

CB(11)ECS: SUIT FAN 1 - Open

CB(16)ECS: SUIT FLOW CONT - Open

SUIT FAN 2 - Open

SUIT FAN ΔP - Open

DIVERT VLV - Open

CO2 SENSOR - Open

CABIN REPRESS - MANUAL As Necessary

To Maintain Cabin Pressure And

Replenish O2

3 When Fire Goes Out

If Cabin Contaminated - Purge As Necessary

CABIN REPRESS - MANUAL

CABIN DUMP VALVE - AUTO

If Ascent Stage Only, Closely Monitor

O2 Supply

Basic Date
Changed

EMER-3

WARNING LIGHTS LM-3

AGS

1. AEA Test Mode Discrete Signals Fail Condition
2. ASA Heater Fails On Causing A Temp Sensor To Open The +12 vdc Supply
3. Power Supplies Out Of Limits

1 Switch To PGNCS Control

2. Perform AGS Self Test 412R (+1 Test Passed)

ASC PRESS

1. He TANK < 2775 psia (Inhibited after Staging)
2. FUEL, OXID TANK < 120 psia

1 Cross-Check PRPLNT TEMP/PRESS MON - ASC

2. Shut Down APS When Press < 120 psi

Close ASCENT He REGS 1&2 And Check For Leak

CABIN

1. Cabin Pressure < 3.7-4.45 psia (Light Disabled In Egress Position)

1. Cross-Check Cabin Press, Suit Press, & Cuff Gages

2. Close CABIN DUMP VLVS, Check PRESS REGS A&B - CABIN, CABIN REPRESS - AUTO

3. Don Helmet & Gloves, Then Turn CABIN REPRESS - CLOSE And PRESS REGS A&B - EGRESS, CABIN GAS RETURN - EGRESS, SUIT GAS DIVERT - PULL/EGRESS To Troubleshoot

CES AC

1. CES AC Pwr Supplies Out Of Tolerance

GUID CONT - PGNCS

(No Rate Damping Or Attitude Control Or No Manual SPS Throttling In AGS)

Basic Date
Changed

EMER-4

CES DC 1. CES DC Pwr Supplies Out Of Tolerance

1. GUID CONT - PGNCs
(No DPS Throttling In PGNS Or AGS, AGS Direct Still Available, DPS May Go To 100%, Deadband Inoperative)

DC BUS 1. Either Or Both DC Buses < 26.5 V

1. Check For BATTERY CAUTION LT, BATT Or DC BUS Component Lights, Check All BAT & BUS Voltages, And Reset All BAT tb's.
2. If No Other Lights - Separate Buses By Opening CROSS TIE BAL LOADS cb And Observing PWR/TEMP MON. If Volts And Amps Not Normal Power Down Low Bus, Open All cb's, Check For Bus Or Feeder Short By Observing DC BUS FAULT LT (If SE BUS) And PWR/TEMP MON (If CDR's BUS)
- 3a. If DC BUS FAULT LT ON (And Unstaged) Indicates ECI Or DFR OPEN - Use BAT 6 NORMAL CDR FEED-ON.
- 3b. If DC BUS FAULT LT ON (And Staged) Power Down Bus, Open All cb's (Except BAT FEED TIE(2) And DC BUS VOLT). If DC BUS FAULT LT Still On Indicates BAT 6 Lost, Reconfigure With BAT 5 Backup Feed. If DC BUS FAULT LT OUT - Indicates Failed ECA.
4. If BATTERY CAUTION LT And DC BUS LT ON - CDR Bus Power Lost - Check BAT tb - If Only One BAT bp (Unstaged Only) Remove Other BAT And Reset The bp BAT. If Both BATS bp (Or 1 Bat bp Staged) Check For Bus Or Feeder Short By Opening All cb's (Except DC BUS Volts) And Observing DC BUS FAULT LT - If LT OFF, CDR BUS FEED SHORT.
5. (For LMP BUS POWER FAILURE, C/W PWR CAUTION LT WILL BE ON) And Flood And Integral Lights Will Be Off - See Procedures Under C/W PWR Procedures

Basic Date
Changed

EMER-5

- DES QTY**
1. Burn Time < 2 Min @ 25
 2. FUEL Or OXID < 6%
(Only ARMED When DPS's ON)

1. Cross-Check PROP QTY
2. Shutdown DPS Before Depletion

DES REG 1. He Downstream Of REGS < 200 Or > 200 psi

1. Close REG 1 & Open REG 2
2. If Press Decay Continues Below 140 psi Shutdown DPS
3. Close REG 2

ISS 1. IMU Fails, ICDU Fails, Or PIPA Fails During Thrust

1. Switch To AGS Control
2. Perform MANUAL Engine Shutdown

LGC 1. LGC Prime Pwr, Scalar, Or Counter fails

1. Switch To AGS Guidance
2. Perform MANUAL Engine Shutdown

PC A REG 1. He REG PRESSURE < 165 Or > 205 psi

1. Cross-Check PRPLNT FUEL MANF And OXID MANF Pressures
2. If Press Below 140 Or Above 205 psi, Turn Off SYS A MAIN SOV And Use CROSSFEED

RCS B REG 1. He REG PRESSURE < 165 Or > 205 psi

1. Cross-Check PRPLNT FUEL MANF And OXID MANF Pressures
2. If Press Below 140 Or Above 205 psi, Turn Off SYS B MAIN SOV And Use CROSSFEED

Basic Date
Changed

EMER-6

RCS TCA

1. One Or More Thrusters Fail Off
2. Colinear Thrusters Fire Simultaneously
3. Detects Thruster Failed On If Rate Feedback In Effect

1. If Only One Red Flag, Close QUAD VALVE
If More Than One Red Flag In Same SYS, Open MAIN SOV or ASC FEED In Affected SYS A or B
2. Complete Translation If Translating
3. If Thruster Firing Continuously, Turn Off QUAD VALVE With Red Flag (This Would Fix Stuck-On Thruster)
4. If Not Continuously Firing Recycle All RCS VALVES To Normal Position - Use TCA cb's And Rate Command Attitude Control To Troubleshoot

SUIT/FAN

1. Suit Pressure < 3.12 psi
2. Suit Fan #2 Fails While It Is Selected

Cabin Depressurized

- 1a. Cross-Check With SUIT And CABIN PRESS, And With PGA CUFF GAGE
- 1b. Check PRESS REG A&B - EGRESS. If Press Still Too Low Set PRESS REG A&B - DIRECT O2 Intermittently To Hold Suit Press Up Until Cabin Can Be Repressurized
- 1c. If Suit Isol Valves Closed And Suit Integrity OK, Pull CB(16) ECS: Suit Flow Cont - Open & Suit ISOL VLVS To Suit FLOW

Cabin Pressurized

- 2a. Cross-Check SUIT And CABIN PRESS And CUFF GAGE
- 2b. Check Suit Flow If SUIT FAN 2 Selected
- 2c. If Suit Isol Valves Closed - Pull CB(16) ECS: Suit FLOW Cont - Open & Suit ISOL vlvs To Suit FLOW

Basic Date
Changed

Basic Date
Changed

EMER-7

CAUTION LIGHTS LM-3

ASC HI REG

1. He Manifold Press > 220 psi

Continue Engine Burn And Close Both ASC He REG 1 & 2

2. Cross Check ASC PRESS
3. When He Press Drops Below 220, Open REG 1 - If Light Comes On Again Close REG 1 And Open REG 2

ASC QTY

1. When About 10 Sec Of Propellant Burn Time Remains

1. Stop ASC Fuel And ASC Oxid Feed To RCS
2. Cross-Check With ASC He Pressure
3. Shutdown ASC Engine

BATTERY

1. Bat Reverse Current > 10 Amp For 4-6 Sec
2. Bat Temp $> 145^{\circ}\text{F}$
3. (Bat Overcurrent Trip Will Result In Additional Loss)

1. Check All Bat tb's. If bp, Try Resetting Bat OFF/RESET Then On
2. Check All Bat Positions And Note On Which Bat The Bat Fault Component Lt Illuminates
3. Remove Faulty Bat From Bus

C/W PWR

1. No C/W Warning Pwr
2. Illuminates With Loss Of Entire LMP Bus

- a. No Other C/W Lights (C/W Failure) - RESET CWEA cb
- a. DC Bus Fault Lt - ON, Flood And Integral Lighting Off (LMP Bus Failure)
- 2b. LMP AUDIO CONT - BU, Pwr Up INV 2, And Open All cb's On LMP Panel (16)
- 2c. If DC Bus Fault Lt Goes Off, Bat To Bus Feeder Open. Set BAT 5 NORMAL SE FEED-ON, Close All cb(16)

EMER-8

- 2d. If DC Bus Fault Lt Stays On, Take Each Bat Off Line In Sequence And Monitor The DC Bus Fault Lt. When Lt Goes Out It Signifies Faulty Bat Removed. Reconfigure With ASCENT BAT 5 And/Or CROSS TIE BUS cb's.
- 2e. If DC Bus Fault Lt Stays On With Both Bats Removed, Open Both BAT FEED TIE cb's. If DC Bus Fault Lt Goes Out It Indicates A Feeder Short. Reconfigure With Bat 5. If Lt On Indicates LMP Bus Short.

ECS

1. Suit Fan $\Delta P < 6"$ H2O
2. CO2 Partial Pressure > 7.6 mm Hg
3. H2O Sep Speed < 800 rpm
4. Glycol Pump $\Delta P < 3$ psid

1. Cross-Check Component Lights And Select Redundant Component
2. If No Component Lights On, CWEA Failure

ED RELAYS

1. Light Illuminates If Contacts Of Master Arm Relay or Staging Sequence Relays Fail Closed (Both Stage System Lights Should Be On When Master Arm - On, And Off When Master Arm - Off)

1. Do Not Turn On Master Arm Switch
2. Attempt To Reset Stage Relay - If Unable Pull Appropriate ED Logic Pwr

GDA/RCCA

1. Light On If There Is Discrepancy Between Gimbal Drive Signal And Gimbal Response During DPS Burn

1. Monitor RCS Duty Cycle And Attitude Rates. If Increasing, Set ENG GIMBAL - OFF
2. If RCS Duty Cycle Still Excessive, Shutdown The DPS

EMER-9

GLYCOL

1. Glycol Temp $> 50^{\circ}\text{F}$
2. Glycol Remaining In Accumulator $< 10\%$

Cross-Check Glycol Temp And Press, CABIN And SUIT TEMPS, And H2O QTY

- 2a. If Glycol Temp $> 50^{\circ}\text{F}$ Observe Rate Of Glycol Temp Increase. If Temp Steady Suspect Thermal Overload Or INST/CWEA Failure
- 2b. If Increasing, Recycle PRIM EVAP FLOW - OPEN
- 2c. If Glycol Temp Continues To Increase, Close PRIM EVAP FLOW And Set PRIM EVAP FLOW #2 OPEN
- 2d. If Glycol Temp Continues To Increase, Activate Secondary Loop By WATER TANK SEL-SEC, GLYCOL INST(SEC), cb GLYCOL PUMP SEC - Close, SEC EVAP FLOW OPEN Then Shut Down Primary Loop
3. If Glycol Temp $< 50^{\circ}\text{F}$ Suspect Low Glycol Quantity, Monitor Glycol Temp, Press Gages

HEATER

1. RR - Temp $< -54^{\circ}\text{F}$ or $> 148^{\circ}\text{F}$
2. LR Heater (C&W Not Operable In LM-3)
3. RCS - Temp $< 119^{\circ}\text{F}$ or $> 190^{\circ}\text{F}$
4. S-BD-Temp $< -64^{\circ}\text{F}$ or $> 153^{\circ}\text{F}$

- 1a. RR Too Hot - Check For Heat Soak, Open Both RNDZ HTR cb's (If Still Too Hot Open CB AC BUS A: RNDZ RDR, Then CB PGNS: RNDZ RDR When RR Not Needed)
- 1b. If Too Cold - Power Up RNDZ RDR
- 2a. LR Too Hot - Open LDG RDR HTR CB & CB PGNS: LDG RDR When LR Not Needed (Note: When CB PGNS Is Closed, Relay Open Line Between CB HTR: LDR RDR & LR Heaters)
- 2b. LR Too Cold - Power Up LDG RDR
- 3a. RCS Too Hot - QUAD A/B-1 & 2 - Open
- 3b. RCS Too Cold - QUAD A/B-1(or 2) - Closed, RCS SYSTEMS A/B-2 Sw - MANUAL
- 4a. S-BD Too Cold - CB COMM: S-BD ANT - Close
- 4b. S-BD Too Hot - CB COMM: S-BD ANT - Open & CB HTR: S-BD-Open (When S-BD not Needed)

Basic Date
Changed

Basic Date
Changed

EMER-10

INVERTER

1. AC Voltage < 112 Volts
2. Frequency < 398 cps > 402 cps

1. Check All AC Bus A/B: BUS TIE INV 1&2 cb's (4)
2. If Some cb's Open Determine If INV 1 Feeder Short Or AC Bus A Or Bus B Short By Pulling BUS TIE INV 1 cb's And Closing Bus Tie INV 2 cb Then Monitor cb's
 - 3a. If All cb's Remain Closed Cross-Check With Pwr/Temp Mon
 - 3b. If Volts In Green - Determine If INV 2 Or CWEA Failure By Powering Up INV 1
 - 3c. If Volts Not In Green - Determine If INV 2 Or INV 2 Feeder Short By Powering Up INV 1 - If Any AC BUS A/B: BUS TIE INV cb2 Open; Indicates INV 2 Feeder Short
4. If All cb's Do Not Remain Closed - Check For AC Bus Short Or INV 1 Feeder Short By Opening Both AC BUS A/B BUS TIE INV 1 cb's And Closing Both AC BUS A/B BUS TIE INV 2 cb's.

LDG RDR

If Light Comes On It Is A Failure Of The LR Data Good Circuit Or CWEA

O2 QTY

1. Descent Qty < 5%
2. Either Ascent O2 Tank Qty < 80% Prior To Staging
3. Ascent O2 Tank #1 Qty < 10% When Staged

1. Cross-Check O2 Qty Gage and Cabin Press
- 2a. If Cabin Press Normal and O2 Leak Outside Cabin Or Cabin Leak. Close Dump VLVs And Put Cabin Repress - Close And PRESS REGS A&B - EGRESS
- 2b. If Cabin Press High - Check PRESS REGS A&B, CABIN REPRESS, PLSS VLVs For Possible Failures
3. If Descent O2 Lost, Go To ASC 1 And Close CABIN REPRESS, SUIT GAS DIVERter - PULL/EGRESS And CABIN GAS RETURN - EGRESS

EMER-11

PRE AMPS

1. Lt On If Either RCS Bias Pwr Supply To The Prim Preamped & Jet Drivers Out Of Limit (One From cb ATCA And One From cb ATCA [PGNS])

1. If Both Bias Voltages Out Of Tolerance There May Be Sporadic RCS Firings

RCS

1. He Tank Press < 1700 psia

1. Cross-Check RCS He PRESS, [PRPLNT, And FUEL MANF And OXID MANF PRES] (The Bracketed Positions Are Useful Only If There Has Been a Propellant Leak Followed By a Bladder Rupture). Cross-Check RCS Qty (Qty Gage Uses He Press)
2. Use Both SYS When FUEL or OXID MANF press 140 psia, Close Bad Systems MAIN SOV For RCS Burns, Use ASC FEED Or CROSSFEED From Good RCS (RCS Fuel And Oxid In Failed System Unusable)

RNDZ RDR

1. When RR Is In Auto Track Mode And Loses CSM Lock-On (NO TRACK LT Should Be On Also)

1. Determine If RR Is Tracking CSM
2. Check For Momentary Data Loss By Selecting MODE CONT - SLEW Then AUTO TRACK
3. Check AGC And XMTR PWR. If Low, Cycle cb PGNS-RNDZ RDR To Eliminate Chrona
4. Attempt Reacquisition With P20 or Visually With AUTO TRACK Or With AGS 400 + 2 And AUTO TRACK Check CSM Transponder

WATER QTY

1. Descent H2O Qty < 16%
2. Either Ascnet H2O Tank Qty < 95% Unstaged
3. H2O In Ascent Tank #1 And #2 Differ By > 15%

Basic Date
Changed

Basic Date
Changed

EMER-12

1. Cross-Check With H2O Gage
2. Verify H2O TANK SELECT In Proper Position
3. Verify SEC EVAP FLOW And PRI EVAP FLOW #2 - CLOSED
4. Monitor Glycol Temp And When $> 50^{\circ}$ Select ASC H2O Tank

COMPONENT CAUTION LIGHTS

DC Bus Fault

Illuminates When Voltages Between Buses Differ; Fully Bright When Voltages Differ By > 18 Volts. When All cb's Are Opened On A Suspect BUS, Then BUS CROSS - TIED To the Other Bus. Light On Will Indicate A Bus That Exists.

Battery Fault

Illuminates When That Specific Battery Temp $> 145^{\circ}\text{F}$, Reverse Current > 10 Amps For 4-6 Sec, Overcurrent Has Disconnect Bat $> 150-200$ Amp.

Range/Range Rate Power Failure Light

Loss Of:

1. Range
2. Range Rate
3. PCM/TE
4. AC Power To Meter

Quit Isolation Valves

Closes At 3.11 psia. Cabin Repress Will Be Activated At The Same Time. (If Enabled)

Cabin Repress

Will Activate At 3.70-4.45 And Close At 4.40-5.0.

UPDATE PADS, PHOTO LOGS, CREW COMMENTS

Basic Date _____
Changed _____
an. 1, 1969
Basic Date _____
Changed _____

LM 3

LM P27 UPDATE

V	V	V	PURP
INDEX	INDEX	INDEX	
			01 306
			02 307
			03 310
			04 311
			05 312
			06 313
			07 314
			10 315
			11 316
			12 317
			13 320
			14 321
			15 322
			16 323
			17 324
			20 325
			21 326
			22 327
			23 330
			24 331
			T
			φ(+N)
			λ(+E)
			NAV
			H CHECK

REMARKS

P27
UPDATE

LM P27 UPDATE

V	V	V	PURP
INDEX	INDEX	INDEX	
			01 306
			02 307
			03 310
			04 311
			05 312
			06 313
			07 314
			10 315
			11 316
			12 317
			13 320
			14 321
			15 322
			16 323
			17 324
			20 325
			21 326
			22 327
			23 330
			24 331
⋮	⋮	⋮	T
⋮	⋮	⋮	φ(+N)
⋮	⋮	⋮	λ(+E)
+	+	+	NAV
			H CHECK

REMARKS

LM P27 UPDATE

V	V	V	PURP
INDEX	INDEX	INDEX	
			01 306
			02 307
			03 310
			04 311
			05 312
			06 313
			07 314
			10 315
			11 316
			12 317
			13 320
			14 321
			15 322
			16 323
			17 324
			20 325
			21 326
			22 327
			23 330
			24 331
⋮	⋮	⋮	T
⋮	⋮	⋮	φ(+N)
⋮	⋮	⋮	λ(+E)
+	+	+	NAV
			H CHECK

REMARKS

P27
UPDATE

LM P27 UPDATE

V		V		V		PURP
INDEX		INDEX		INDEX		01 306
						02 307
						03 310
						04 311
						05 312
						06 313
						07 314
						10 315
						11 316
						12 317
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						22 327
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	.		.		.	NAV
	.		.		.	H CHECK

REMARKS

P27
UPDATE

FLIGHT PLAN UPDATE

[illegible]

F.P.
UPDATE

FLIGHT PLAN UPDATE

FLIGHT PLAN UPDATE

TIME

ITEM

TIME

ITEM

9

10

12

13

14

15

F.P.
UPDATE

F.P.
UPDATE

PHOTO LOG
16mm (CEX368,EF)

START GET	MAG	Ft	REMARKS (f,t,LENS,FPS)
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TIME

REMARKS

16mm
LOG

LOG

TIME	REMARKS
	ENTRY STATUS CHECK:
	N.C. - PLWR SWITCHOVER AS IN
	THE BOOK - CW PLWR CAUTION LIGHT
	INDICATES SWITCHOVER WITH MOMENTARY/
	DEP OR & PROSTHER ASD
	DROP IN LIGHTING; LEFT IN WRONG POSITION.
	VHF ACTIVATION: NO DIFFERENCE IN COMM
4	WITH ANY ANTENNA COMBINATION
	EXCEPT THAT IN RND2 CONFIG COMM
	SEEMED TO DEGRADE SLIGHTLY
	GLYCOL PUMP ACTIVATION: NO PROB - SOUNDED LIKE JUST
	A LITTLE GAS IN SYSTEM AT START.
	C&W CHECKOUT - AL: LIGHTS EXACTLY AS IN
	CHECKLIST! I OWE YOU A SPAGETTI
	DINNER AT ALMA'S
8	CB ACTIVATION: GLYCOL TEMP USUALLY GOT > 60°
	PRIOR TO FINISHING ACTIVATION ∴ HAD TO
9	CLOSE CB(16) PRI GLY EVAP FLOW & OPEN H ₂ O.
	TB VERIFICATION: HAD STICKY SYS A ARE FEEDING
10	T.B. HUNG UP ON GRAY → ALSO CHARACTERISTIC
	OF T.B. TO GO GRAY WHILE HOLDING
1	SWITCH.
12	SUIT FAN & H ₂ O SEP CHECK - H ₂ O SEP COMP LT TAKES
	ALONG TIME TO COME ON (TOO LONG TO WAIT)
	& WHEN SWITCHING TO ^{OTHER} SEP IT EVIDENTLY WAS
13	ALREADY UP TO SPEED SINCE LIGHT DIDN'T COME
	ON.
14	S-BD & VHF ACTIVATION: - ON RND2 DAY THE LMP UNIS
	PIT & ACA PIT WERE INOP. VOX OK.
15	OPS CK. CDR OPS HTR CK DIDN'T LIGHT LIGHT
	ALTHOUGH ON EVA DAY IT WORKED 1 OUT OF 5

LOG